COMPUTERWORLD

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MCI Releases E-Mail Service As First Entry In Smart Net Set

By Phil Hirsch
CW Washington Bureau

WASHINGTON, D.C. — MCI Communications Corp. last week unveiled an electronic mail service that offers rates substantially below current competitive offerings.

Dubbed MCI Mail, it is the first of several smart network services that will be offered by MCI Digital Information Service Corp., a newly formed MCI subsidiary.

For $1, an MCI Mail subscriber can transmit up to 7,500 characters to any other subscriber. That is the equivalent of about five pages of text, according to the company. Alternatively, a private courier service such as Purolator Corp. will deliver a hard copy of the same message to an addressee located in any of 15 major cities. MCI has a processing center in each city equipped with a laser printer. Delivery is guaranteed within four hours after the message has been sent.

Overnight courier delivery of a

(Continued on Page 6)

Teenage Hacker Lectures House On DP Security

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — Accessing computer systems linked to telecommunications networks without authorization is almost child's play. But effective preventive measures are simple and inexpensive, one of the infamous "414" hackers told a House of Representatives subcommittee last week.

The 414s are a group of young computer enthusiasts who gained notoriety recently following reports of their alleged breaches of computer security around the country.

Neal Patrick, a 17-year-old high school senior, told the Science and Technology Subcommittee on Transportation, Aviation and Materials that he is, in the words of his attorney, who accompanied him, "not an information age Robin Hood" and he regrets his actions. Patrick said he now realizes "the potential for damage was enormous" in the actions of the loosely knit, seven-person 414 group.

The group reportedly accessed via GTE Telenet Communications Corp.'s Telenet network some five dozen computer systems around the

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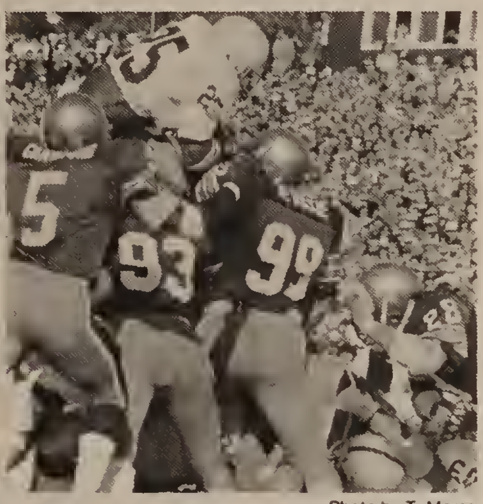

Photo by T. Morse

As two teams clash on the collegiate gridiron, it becomes a simple test of strategic mind against sheer muscle, right? Wrong. In today's football, as in many sports, the computer plays an increasingly important role in planning before, during and after the big game. And if you want to be a football hero, you can't just rely on microcomputers, as Boston College's Eagles have shown. See Page 15.

Inside

The vendor delivered and the installation went fine. However, one of the first users of IBM's System/36 minicomputer is still waiting for IBM to deliver the necessary machine code needed to convert programs from a System/34 computer. **Page 5.**

• • •

Speaking of deliveries, Digital Equipment Corp. last week put its stamp on a souped-up version of its Rainbow personal computer. The firm also unveiled a buyer's protection plan for both retail and corporate customers. **Page 6.**

• • •

The police in Michigan also had their share of deliveries recently, in the form of an alleged con artist/thief who was nabbed by an on-line realty computer system called Midas while allegedly going for someone else's "gold." **Page 14.**

• • •

The breakup of AT&T will be completed Jan. 1. However, the firm's local communications spirit will live on in the form of an independent Central Services Organization. Run by former Bell employees, the CSO will aid regional networks and even dabble in cellular radio. **Page 65.**

• • •

Storage Technology Corp. has announced a nonerasable optical disk storage system that boasts up to 4G bytes of memory and is one of the first to be compatible with IBM mainframes. **Page 75.**

• • •

Is the shine on Apple Computer, Inc. beginning to fade? That's what analysts say, especially following a severed micro-to-mainframe agreement with Cullinet Software, Inc. and lack of demand for its highly touted Lisa computer. **Page 89.**

Harris Unwraps 48-Bit System Aimed at DEC, DG Superminis

By Ed Scannell
CW Staff

FORT LAUDERDALE, Fla. — Billing it as the industry's fastest single-processor superminicomputer, Harris Corp. today unveiled a top-of-the-line 48-bit, virtual-memory system that will be directed at both the scientific and high-performance business markets. The Harris 1000 is the firm's most powerful minicomputer to date.

Capable of processing four million instructions per second, the Harris 1000 is 350% faster than Digital Equipment Corp.'s VAX-11/780 and almost 60% faster than Data General Corp.'s MV/10000 superminicomputers in scientific applications, according to Harris' Whetstone benchmark tests.

The Model 1000 is software-compatible with Harris' Model 600, 700 and 800 superminicomputers and can also use those systems' peripherals. Fully configured, the Model 1000 supports 192 terminals, a spokesman said.

Harris attributes the Model 1000's processing speed in part to the first-time use of 100K-bit emitter-coupled logic technology, which the company claims is two to three times faster than Schottky transistor-transistor logic technology.

By incorporating ECL circuitry into the 1000's CPU, designers were able to employ high-speed large-scale integrated circuits and interconnection techniques usually re-

(Continued on Page 4)

Corporate Power Struggle Brewing

Merger of Voice, Data Networks Foreseen

By Jim Bartimo
CW Staff

CW at TCA '83

SAN DIEGO — A major power struggle is brewing between the voice and data communications departments as corporations combine voice and data on the same network.

Most of the randomly selected attendees of the Tele-Communications Association annual meeting (TCA '83) held here last week said that the struggle will force both departments to merge, with voice communications emerging as the dominant technology.

A few of the telecommunications managers and attendees surveyed at the show referred to data processing professionals as "empire builders" and "power brokers," noting that voice communications professionals are much more accustomed to working with users than are the data departments.

"They speak a language all their own," said one telecommunications manager who chose to remain anonymous. "We wanted to buy electronic typewriters, and the data processing department said we had to go through them first because the machines had memory."

The merging of the voice department (usually organized under facilities or building management) and data departments (under the umbrella of administration) will involve a major reorganization, according to Dennis Briley, manager of general services for Downey Savings and Loan Association of Costa Mesa, Calif.

"From a prejudiced viewpoint, I think the network is going to end up on the voice side with the [private branch exchange]," Briley said. "Data people would like to keep their data world intact, but with the personal computer in the company, the back room secret is out."

In addition to the DP department's alleged reputation for not delivering quality service to the end user, there is the problem that telephones are mostly analog and computers are all digital.

"They're in two different worlds right now," said Dale Lindsay, telecommunications analyst for the Los

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Please address all correspondence to the appropriate department at Box 880, 375 Cochituate Road, Framingham, Mass. 01701. Phone: (617) 879-0700. Telex: 95-1153.

OTHER EDITORIAL OFFICES
& SALES OFFICES:

New York: Suite 7G, 401 East 80th St., New York, N.Y. 10021. Phone: (212) 570-2135.

West Coast: 1060 Marsh Rd., Menlo Park, Calif. 94025. Phone: (415) 328-8064.

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Euan Rose, Bill Dunlop, Stephen Thomas, Beere Hobson Assoc., 345 Goswell Rd., Islington, London EC1V FHN Phone: 01278 3415/6 (reps for all CWCI publications except Computer Management and Computer Business Europe).

W. Germany: Eckhard Utpadel, CW Publikationens, Friedrichstrasse 31, 8000 Munich 40. Phone (089) 38172-0. Telex: 5215350.

France: Axel Leblois, Le Monde Informatique, 185 Avenue Charles De Gaulle, 92200 Neuilly Sur Seine, Paris. Phone: 758 14 14. Telex: 613234 F

Japan: Mr Shuji Mizuguchi, Computerworld Japan, 7-4 Shintomi 1-Chome, Chuo-ku, Tokyo 104. Phone (03) 551-3882, Telex. 252-4217 (Computerworld Japan only).

Esteban H Yamada, Tokyo Representative Group, Yamaguchi Bldg., 2-12-9 Kanda Jimbo-cho, Chiyoda-ku, Tokyo 101, Phone (03) 230-4117/B, Telex. J26860 (reps for all CWCI publications except Computerworld Japan).

Australia: Alan Power, Computerworld Pty Ltd., 37-43 Alexander Street, Crows Nest, NSW 2065. Phone: (02) 4395133, Telex AA74752 COMWOR.

Brazil: Eric Hippeau, Data News, Computerworld do Brazil, Servicos e Publicacoes Ltda., Rua Alcindo Guanabara, 25/10th Floor 20031 Rio de Janeiro, RJ Brazil. Phone: (021) 240-8225. Telex: 2130838(WORD BR).

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Denmark: Preben Engell, Computerworld/Denmark, Gammel Strand 50, 1202 Copenhagen K. Phone 01-1234-11. Telex. 27566 cwdan.

Sweden: Bengt Marnfeldt, Computerworld/Sweden, Nova Media AB, Vartavagen 55, 11538 Stockholm. Telex: 8105099 NOVACW.

The Netherlands: Johannes A. Witvoet, Mgr. Dir., CW Communications B V., c/o IDC Benelux, Prins Hendriklaan II, 1075 Ax Amsterdam Phone 020-791-692. Telex: (844) 15741

Italy: Daniele Comboni, Gruppo Editoriale Jackson, s.r.l, Via Rosellini 12, 20124 Milano.

Argentina: Ruben Argento, Gen. Mgr., Computerworld Argentina, Av. Belgrano 406-Piso 9, CP 1092 Buenos Aires. Phone: 34-5583/5584.

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Facing Charge of Pirating Copy

FBI Nabs Student in Software Theft

By **Jeffry Beeler**
CW West Coast Bureau

SAN FRANCISCO — Local Federal Bureau of Investigation agents last month arrested a Purdue University student who allegedly tried to sell a pirated copy of his former employer's proprietary software product to a Bay Area-based consulting firm.

James Barrick Jr., 22, has been charged with interstate transportation of stolen property for reportedly offering a finite element modeling program, including its source code, to Anamet Laboratories, Inc. in nearby San Carlos, Calif.

Used primarily by structural engineers, the Supertab Release 7.0 program is the brainchild of Milford, Ohio-based Structural Dynamics Research Corp. (SDRC), where Barrick worked on and off under a co-op student agreement between SDRC and Purdue.

Until his Sept. 9 arrest, Barrick was one of about 20 participants in the co-op student program, in which university students work at SDRC and pursue their undergraduate studies in alternating semesters, according to the company's attorney, Douglas Thompson.

Before he finished his latest work cycle at SDRC and returned to Purdue at summer's end, Barrick is believed to have illicitly copied Supertab 7.0, whose price ranges from $50,000 to more than $1 million, Thompson said.

He then offered to sell the resulting object and source code tapes — as well as their accompanying program manuals — to Anamet for $34,000, according to FBI press spokesman Frank Daniel.

Software Developers

Both Anamet and SDRC are consulting firms and, to a lesser extent, software developers specializing in structural engineering jobs. Anamet's vice-president, Richard Citerley, characterized the two companies as direct competitors, but Thompson disagreed.

Although it has recently created some software packages that "might be construed as being competitive" with SDRC's products, Anamet is more of a consumer of engineering analysis and modeling programs than a developer, Thompson said. The reverse is said to be true of the Ohio company.

Barrick's alleged efforts to sell Supertab to Anamet led him eventually to call Citerley for the first time on Aug. 10, Daniel said. Citerley then reported the overture to SDRC, which in turn informed the FBI.

In an effort to abort the proposed theft and trap its would-be perpetrator, federal investigators approached Citerley and persuaded him to play along with Barrick in his alleged scheme and keep them abreast of his actions.

Two Transactions

Barrick's involvement with Anamet was reportedly marked by two main transactions. In the first, he mailed Citerley two SDRC program manuals and a reel of magnetic tape containing Supertab 7.0's object code. In the second, about two weeks later, he sent Anamet another batch of tape purported to contain the modeling package's source code, Citerley said.

Partly because of their proprietary nature, all the stolen program materials were immediately confiscated by the FBI, Thompson added.

A few days after the tapes and manuals reached their destination, Barrick allegedly flew here from the Midwest for a scheduled meeting with Citerley. But instead of consummating the deal and receiving the promised payment for the stolen materials, he was arrested by waiting FBI agents and charged with one count of transporting stolen goods across state lines.

That particular offense carries a maximum penalty of 10 years in federal prison or a $10,000 fine — or both, Daniel said.

Barrick's alleged entanglement in the Supertab theft scheme abruptly ended his three-and-a-half year participation in the SDRC co-op student program, which gives university undergraduates an opportunity to gain practical work experience. The program exposed him to a wide variety of technical tasks, one of which was to fix bugs in SDRC's programs, and gave him ready access to Supertab's latest release, Thompson said.

Taking advantage of his privileged position, Barrick was apparently able to duplicate Supertab's master source code tapes without his employer's knowledge, the attorney speculated. None of the master tapes, which are kept under lock and key, has ever been reported missing.

This Week

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2. BAD DOCUMENTATION LEADS TO COSTLY MAINTENANCE: Even if the documentation started out being accurate, it's probably never been updated. When modifications occur, someone's got to go back and attempt to divine the underlying logic before new code can be inserted. A long and costly operation.

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Power Company Short-Circuits Meter Thieves

By John Gallant
CW Staff

NEW ORLEANS — Electricity thieves beware; the long arm of the law now has an even longer reach, thanks to a computerized detection system designed to expose Louisiana Power and Light Co. (LP&L) customers who tamper with their electric meters.

According to company spokesman James Fort, when customer payments are processed through the IBM 3081 mainframe operated by Middle South Services Co., a division of Middle South Utilities, Inc., the computer system automatically alerts authorities to those customers whose bills have dropped significantly over a period of two or more months.

Middle South Services provides computer services to the parent company's subsidiaries, which include the Louisiana, Arkansas and Mississippi power and light companies, and New Orleans Public Service Co.

LP&L began the pilot program in the neighboring towns of Chalmette and Arabi, La., last year. Though Fort would not comment on the number of power thieves apprehended, he said the program was so successful the company has expanded it to include the 85,000 LP&L customers in the Algiers-Gretna district of New Orleans. After reviewing the results found in that area, LP&L may widen the scope of the detection system to include metropolitan New Orleans within the next year, according to Fort.

"This system has proved to be quite effective in ferreting out customers tampering with their meters. It's really helped us in prosecuting those people who are abusing the system. The program shows a great deal of promise," Fort said.

Fort compares the theft of electricity to shoplifting in a retail store. While he would not estimate the amount of electricity stolen each year by meter tamperers, he said the price of electricity must be increased to make up for the loss.

"Meter tampering has certainly affected costs. The loss eventually winds up affecting other consumers. It's like the situation at any department store; the pilferage ups the prices to other customers."

According to Fort, the illegal practice is also punishable with fines ranging from $500 to $1,000 and up to a year in prison.

If a customer's bill drops for just one month because the family is away on vacation, for example, the computerized detection system will not flag the payment record. The program is designed to alert LP&L officials only to those consumers whose bills drop substantially for a period of two or three months or more.

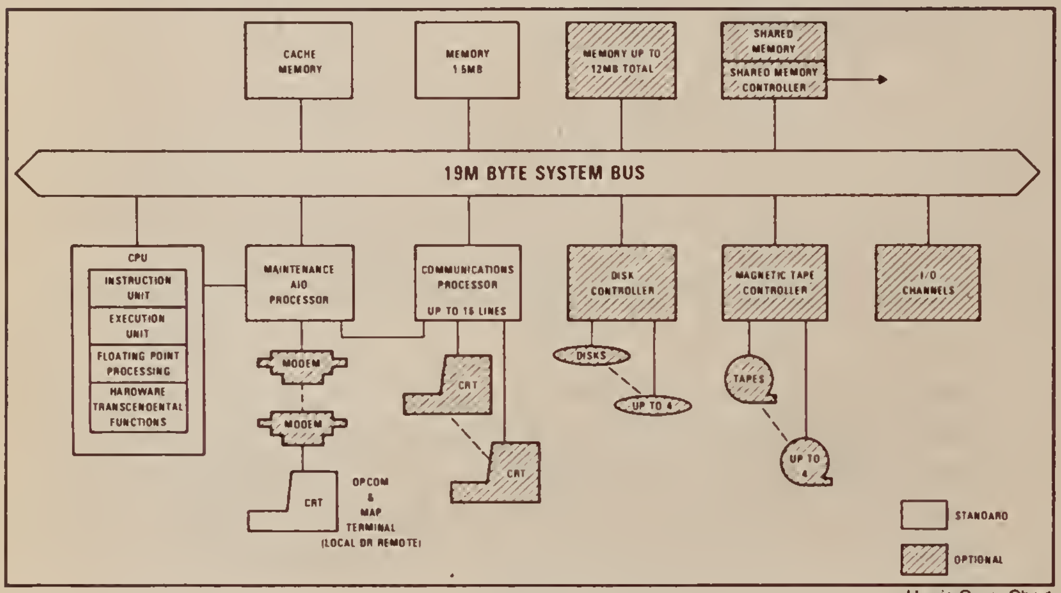
Once alerted, those officials confront offenders with the evidence. Fort said that violators are usually more than willing to pay the amount the company estimates they have stolen, rather than face prosecution.

"We usually add up what we believe was stolen, plus the cost of the investigation and any amount of damage to our equipment. If they don't agree to pay the costs, we'll file suit. But, we rarely have to do that," Fort said.

LP&L began the computerized detection program in an effort to stem the growing incidence of electricity theft.

The company still monitors meter tampering in other districts with what Fort described as a fairly sophisticated investigative system involving meter readers and specialists, but he admits the new computerized system allows LP&L to accomplish a great deal more.

Harris 1000 Geared Toward Science, Business Markets



Harris Corp. Chart

Harris 1000 System

(Continued from Page 1)

served for use in supercomputers. These circuit integration and packaging technologies have enabled the company to build 60,000 logic gates and 1 million static random-access memory (RAM) bits into a single CPU card, a spokesman pointed out.

Another factor contributing to the Model 1000's increased overall performance is the hardware implementation of virtual memory and transcendental functions in the CPU, the spokesman said.

The 1000's demand-paged virtual memory totals 48M bytes. The CPU has one virtual address register for each page to track the virtual-to-physical memory relationship for every page, a spokesman stated. This implementation results in virtual memory benefits without the performance drawbacks associated with software virtual memory.

Hardware-implemeted transcendental functions in the CPU include sine, cosine, tangent, arc sine, arc cosine, exponent and logarithm. All of these functions are directly supported by the firm's VOS operating system and its Fortran compiler.

Also implemented in the 1000's hardware is 32-bit single precision, 48-double precision, 64-bit triple precision and 96-bit quadruple precision. Users have the option of selecting the precision needed for particular calculations without incurring any performance degradation, a spokesman related.

Complementing the CPU is the Maintenance Aid Processor (MAP), a microprogrammed processor that controls power-up diagnostics and runs checks on memory, I/O channels and CPU data paths before loading microcode each time the system is powered up. The MAP also carries out local or remote system maintenance.

Another processor, the Communications Network Processor (CNP) is a standard component in the 1000 and controls communications through asynchronous, synchronous, bisynchronous and Ansi X.25 protocols. A single-board CNP supports up to 16 communications lines for either local or remote device connection. As many as 14 CNPs reportedly can be configured with the 1000.

The system's soft control store feature allows the CPU's microcode for instructions to be implemented in RAM instead of its more traditional residence, programmable read-only memory. This feature allows users to integrate enhancements by distributing new microcode instead of field upgrading via CPU boards.

The 1000 model uses the company's recently introduced Integrated Memory Subsystem, which contains the memory controller and 1.5M bytes of memory on a single board for both main memory and shared memory. Also part of the subsystem is the company's Integrated Disk Controller, which combines the functions of an I/O and disk controller.

The CPU is housed on 10 printed-circuit boards and fits into a single 19-in. cabinet with memory and I/O placed in a second cabinet. In this arrangement, up to four peripherals can be installed.

Priced at $250,000, the basic configuration of the 1000 is made up of the CPU with 6K bytes of cache memory, 16 external interrupts, a line frequency clock and an internal timer, 1.5M bytes of memory, one CNP with an operator's console port, a CRT terminal as an operator's console and MAP terminal, the VOS operating system and dual cabinets.

Initial shipments of the 48-bit system are slated for early next year, the company said from 2101 W. Cypress Creek Road, Fort Lauderdale, Fla. 33309.

DP Degrees May Not Prove Enough for Big Bucks

By Katherine Hafner
CW Staff

INDIANAPOLIS — Unless accompanied by a good dose of experience, a degree in data processing may not be worth its weight in parchment.

That is the conclusion of a recent salary survey by International Computer Programs, Inc. (ICP), which found that a DP professional with a high school diploma and several years of experience is paid as much as, if not more than, a colleague with a bachelor's or master's degree.

"A professional's experience seems to be the winning ticket, even in management positions," ICP President Larry Welke said. "While a computer science student takes time to complete the academic requirements for a degree, others are out in the business world acquiring experience and being well compensated for it."

According to Welke, the reason that advanced degrees are not as stiff a requirement in DP as in other fields is that current curricula do not properly prepare students to enter the profession.

"Universities cannot compete with DP salaries in the business world," Welke explained. "To tempt the best and brightest in the working world into academia is a supreme challenge."

The survey's statistics were compiled with personnel information provided to ICP by its 220-member companies.

The survey also found that DPers in the East are paid considerably more than those in the Midwest. Regional salary statistics compiled by ICP reveal that a DP manager in the East makes an average of $73,980, while his Midwest counterpart makes $57,743.

Below DP managers are systems development managers. Those in the East make an average of $59,533, while those in the Midwest make $47,195.

At the bottom of the heap fall programmer trainees; those in the East make $18,349, while trainees in the Midwest average $16,231.

According to the survey, yearly salary increases, which have traditionally been high, have dropped from a 10% to 15% increase to a 5% to 10% increase.

Turnover, too, has slowed from 20% to 30% in recent years to 10%, according to the survey. ICP attributed this to "the reluctance of DP professionals to change jobs in an inflationary environment."

The survey is available to ICP member companies from ICP, 9000 Keystone Crossing, Box 40946, Indianapolis, Ind. 46240.

System/36 First User Satisfied, But Waiting

By Ed Scannell
CW Staff

MONTPELIER, Vt. — One of the first users of the System/36, IBM's long-awaited upgrade to its widely used System/34, reported that the delivery and installation of its system went smoothly.

And based on benchmark tests, Vermont Mutual Insurance Co. is looking forward to the system that will eliminate the throughput and storage crunches currently burdening its two System/34s.

The reason Win Perron, DP manager for Vermont Mutual, is still looking forward to his 12-week-old System/36 solving his problems is IBM's failure to deliver proprietary machine instruction code necessary to develop a compatible data base management system (DBMS). Without the DBMS, which is Cincom Systems, Inc.'s Total, Perron is unable to convert his library of System/34 software so it will run on System/36.

Half Dozen Others

According to Richard French, product manager at Cincom, there are a half dozen other firms besides Vermont Mutual waiting for IBM to release the necessary code. French said IBM signed an agreement with Cincom two weeks ago, agreeing to deliver the code, but has yet to receive the code. French added, however, that IBM sent a letter of confirmation last Tuesday, telling Cincom it would have the necessary code in hand by Sept. 29.

French suspected that the late delivery of the code is due to the usual bureaucratic tangle rather than IBM's decision, made last February [CW, Feb. 28], to restrict or eliminate program materials from certain of its licensed programs. That policy was scheduled to take effect Sept. 1.

"It could very well be," French said, alluding to the possibility that IBM's delay in delivering the code is an implementation of its new policy. "I remember we had to fill in all sorts of forms to get to use it," he said.

Asked about the delay, an IBM spokesman said the code's documentation review process was taking longer than expected, but said he thought IBM would "forward all of the material Cincom requested within the next 24 hours." He added that IBM's longer-than-expected delivery of the code has nothing to do with its decision to restrict source code.

"We do have a new policy with source code, but I am told that Cincom did not need and did not ask for source code material. They were requesting access to the privileged instruction set, and that is not part of the source code."

Perron said it was his understanding this code would be delivered along with the system. "This [lack of code] has been a problem in the past, but I was led to believe it wouldn't be this time. It has caused a slight delay in our conversion to the 36," he explained.

While he has been waiting for delivery of the code, Perron said he has been using the System/36 to run financial assistance systems such as stocks-and-bonds portfolios, but "nothing tying the main systems together."

Ron Grant, president of Systems Assurance Corp., the company that developed all of Vermont Mutual's applications software, said IBM's failure to deliver the proprietary code involves usual bureaucratic tangles and issues of security. Grant said IBM's concern about the code falling into the hands of plug-compatible manufacturers, particularly the Japanese, is legitimate, but it is a problem that should have been resolved some time ago.

"There is a valid area for concern, but it is one of those things they could have resolved in an hour anytime during the past year. They provided me with assurances a year ago that they would address this properly," Grant said.

According to Grant, IBM has made an agreement to resolve the problem and has appointed someone to address it. He added, however, that IBM has been promising to resolve the problem "in a week or two for the past several months."

Perron said he was apprehensive about being a pioneer user of the System/36.

"Experience tells you that you don't want to be the first kid on the block [to buy a system], but I was torn by the fact that I was outgrowing the machines. I had to be a much earlier recipient than I normally would want to be," Perron said.

Aside from the tardy software, everything connected with the system's delivery and installation went smoothly, Perron said. He said the system was so easy to configure and power up that the presence of IBM personnel was not necessary.

When evaluating potential upgrades for the System/34s, Perron said he wanted to stay with a mini-type system rather than a mainframe because of the unexplored potential he feels minicomputers have. "I think their potential resources haven't been tapped. Therefore, our intention always was to stay with a mini-type system."

Looking back, Perron said he is happy with his decision to go with the System/36 and would only do one thing differently. "I would have it written in blood that IBM give me that code earlier," he said.

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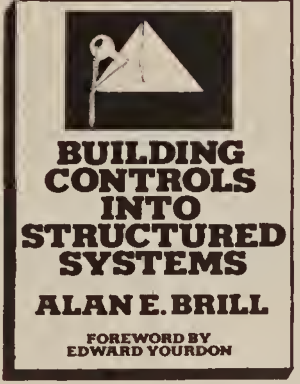
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DEC Seen Confronting IBM's XT

Rainbow 100+ Bows With Special Service Plan

By David Myers
CW New York Bureau

NEW YORK — In what is seen by some as an attempt to dress up its image, Digital Equipment Corp. unwrapped a stepped-up version of its personal computer and announced a buyer's protection plan here last week.

In a news conference here, the Maynard, Mass.-based computer vendor introduced the Rainbow 100+, a small computer with a 10M-byte Winchester hard disk backed up by two floppies. At the same time, the company announced a warranty plan giving retail buyers a year's worth of protection and corporate buyers 90 days' worth.

"We are becoming the tough marketers many of you said we must be," Edward A. Kramer, vice-president of corporate marketing, said.

In other developments, DEC said Microsoft, Inc.'s MS-DOS and Digital Research, Inc.'s CP/M 86/80 operating systems, as well as Lotus Development Corp.'s Lotus 1-2-3 financial spreadsheet, would be available later this month on the small computer and noted that a Unix Version 7 would be available later this month for its Professional series microcomputer.

Industry insiders pointed out that the version of DEC's personal computer is directly slotted against IBM's Personal Computer XT. Along with the new IBM-like service plan, the decision to go head to head with IBM's XT betrays DEC's desire to establish itself as IBM's primary competitor in the personal computer market, some industry observers said.

"I see [last week's announcements] as DEC's way of differentiating itself from the others in the tier of companies below IBM," Frederic H. Cohen, an analyst at Rothschild, L.F. Unterberg, Towbin here, said. He named Hewlett-Packard Co., Wang Laboratories, Inc., Data General Corp. and "maybe" Apple Computer, Inc. as the other companies in the "second tier."

Other consultants and analysts agreed that the timing and style of the announcements overshadowed what was actually announced.

"It is important in the overall face-off that is coming down to IBM and DEC anyway. It provides the image which IBM has established already and which DEC must establish if they are going to compete effectively," George J. Weiss, director of computer systems studies for Quantum Science Corp. here, said.

Weiss called last week's announcements a "facial uplift" for the company.

"They sure do need one," Marc G. Schulman, an analyst at First Boston Corp. here, maintained.

"Here's a company that grew up in the cold scientific and engineering world. They never seemed to understand that if you're going to succeed in personal computers, you need a little flash and hype," Schulman said.

For the most part, consultants and analysts were not awed by the technological advances of DEC's personal computer version.

"Were there any technology surprises? No. I thought Lotus might come in under CP/M, and it did not," Cohen said. DEC said the spreadsheet package created by Cambridge, Mass.-based Lotus, available later this month, will run under MS-DOS.

"It's a system combining user expectations for additional power and capability. It's not something radical and earthshaking, but it shows a commitment," Weiss agreed.

Aaron Goldberg, research manager for information systems at Framingham, Mass.-based International Data Corp., called the latest Rainbow a very attractive computer at "quite a low price. It gives people an alternative to IBM," he said.

DEC said the latest version of the Rainbow personal computer is aimed at small to mid-size businesses and corporate managers. It holds 128K bytes of main memory and runs MS-DOS and CP/M 86/80 operating systems at $250 extra.

Schulman said his calculations showed the Rainbow — with the dual operating system option and a printer added on — would sell for about $7,020, while the comparable array from IBM would cost $7,094.

DEC lists the computer at $6,295, including keyboard and monitor. The company also said it is offering a 10M-byte hard disk upgrade kit at $2,995 for its original Rainbow 100, which retails for $3,495.

In a prepared statement, DEC described the Rainbow 100+ as equipped with "[Zilog, Inc.] Z80A and [Intel Corp.] 8088 microprocessors, a 10M-byte Winchester hard disk, a dual floppy diskette with 800K-byte capacity, [synchronous/asynchronous] communications, built-in terminal emulator, printer port and 128K bytes of system memory."

The system will also permit the mounting of a 256K-bit chip on board, "allowing you to get 900K [bytes] out of the memory. That meets most present-day user requirements," Weiss said. Use of the Lotus package requires 256K bytes of memory, DEC cautioned.

DEC is headquartered at Maynard, Mass.

DEC's Warranty Perceived As Boon to Small Business

NEW YORK — The warranty plan announced here last week by Digital Equipment Corp. may not sway corporate managers from buying IBM Personal Computers, but for small businesses and home users it might just be enough to clinch the sale.

That is the consensus of opinion in the wake of DEC's announcement that retail buyers of the manufacturer's personal computer will be guaranteed one year of on-site service. Corporate buyers are guaranteed for 90 days.

"There is probably no other company in the business that can think about doing this," Joel Schwartz, small systems group vice-president, said at the press gathering where the plan was made public.

George J. Weiss, director of computer systems studies for Quantum Science Corp. here, said the warranty is "a direct challenge to IBM's service mystique."

The warranty, called the Investment Protection Plan, includes a one-year guarantee covering all software and optional add-ons purchased with the DEC system. In addition, buyers are offered a year's use of a toll-free telephone number to call in times of trouble.

A 30-day money-back return policy expires Jan. 31, 1984.

IBM's Personal Computer warranty is a three-month plan requiring the purchaser to return the equipment to the store. Software is not covered under the plan.

DEC dealers said their warranty plan would increase sales of the Maynard, Mass., company's personal computers.

"No other company does anything like that. It's the best way to get a computer and get started with it," Philip A. Boerger, vice-president of business products at Berliner Computer Centers here, said.

One dealer compared the on-site warranty to an auto maker's promise to make any repairs in the buyer's driveway.

For corporate buyers, however, the warranty is expected to have less of an impact.

"If you were going to buy IBM, this won't sway you. But if you were going to buy DEC anyway, this works as a discount," Frederic H. Cohen, an analyst with Rothschild, L. F. Unterberg, Towbin here, said.

MCI Takes Wraps Off Electronic Mail Service

(Continued from Page 1)

7,500-char. message costs $6. The recipient can be in any of 20,000 continental U.S. cities, and MCI promises to complete delivery by noon of the following day.

For $2, MCI, after transmitting the message to one of its 15 terminating cities, will deliver it via the U.S. Postal Service.

In most cases, there will be no additional charges.

A spokesman for Federal Express Co., which offers a service that competes directly with MCI's new offering, maintained that "we've always anticipated" competition; he took the position that his firm's service is designed to be "superior and extremely competitive with anything else being offered." He noted that MCI is "talking about transmission of data; we're talking about transmission of images. They're talking about involving other parties, such as Purolator and first-class mail . . . we've involved only our own employees."

The MCI service, accessible through a dial-up local telephone call, interfaces with any personal computer that has an asynchronous 300 or 1,200 bit/sec communications interface, said J. Robert Harcharik, president of the new subsidiary. A variety of communicating word processors and low-speed terminals can also be connected, along with telex machines, Harcharik added. Word processors reportedly compatible with the service include some or all of those made by Lanier Business Products, Inc., Wang Laboratories, Inc., Xerox Corp., IBM and Digital Equipment Corp., Harcharik explained.

Every MCI Mail subscriber, regardless of his terminal type, receives a telex number, and he can both send and receive domestic and international telex messages through the network. The question of whether to add a facsimile machine interface is still under consideration, he added.

The U.S. Postal Service charges $9.35 for overnight delivery of a 3- to 5-page message, and private courier service rates are approximately the same or higher, according to Harcharik. Contending that MCI Mail is 30% to 50% cheaper, he maintained that underpricing the competition will enable MCI Mail to tap a new market comprised of "hundreds of thousands" of subscribers.

Although this market consists largely of home computer users, it also includes companies. MCI Mail has two features designed especially for this latter group. Letterheads, signatures, invoice and other business form formats can be stored within the system — and accessed automatically — for $10/year. Also, a user who wants to address letters on a recurring basis to a specified group of recipients can store their names and addresses within the system for $10/mo.

The growing use of personal computers, the growing need for transmitting time-sensitive messages plus new options will expand the market for the new service, Harcharik said. One upcoming option would be bulk rates for mass mailers which will reportedly be offered "in a few months."

Three Firms Charged

T/S Service Subject of $53 Million Lawsuit

By Jim Bartimo
CW Staff

LOS ANGELES — Claiming the time-sharing services they contracted for were never properly rendered, a real estate management company and a retirement community here have filed a $53 million breach of contract suit against McAuto Systems Group, Bradford National Corp. and McDonnell Douglas Corp.

However, at least one of the defendants has denied responsibility for the alleged loss of service. In a statement released to *Computerworld*, Bradford National, a diversified financial services provider, said it is initiating a separate lawsuit objecting to any alleged wrongdoing and charging one of the principals in the real estate management company with the illegal taping of telephone conversations.

When contacted recently, McAuto, McDonnell Douglas' time-sharing subsidiary, refused to comment on the case. However, the legal volleys between defendants and plaintiffs will probably come before the court sometime next year.

Golden Rain Foundation, a retirement community in Laguna Hills, Calif., and its management, Professional Community Management, Inc., contracted with Bradford National's time-sharing branch in 1981 for general ledger, accounts payable, accounts receivable, fixed assets and investment management applications. "In late 1981, we had massive defects in the system design and found fraudulent status reports," Anthony C. Ligoretti of Professional Community Management said. "It took us months to process one month's accounts."

Upon further investigation, Professional Community Management allegedly found that many of the specific programs it needed were not written, although reports from Bradford National indicated progress was on schedule. "We found that programs were untested or unwritten; there was a really good cover-up job," Ligoretti continued.

Still more problems arose when Bradford sold its time-sharing subsidiary, Bradford Administrative Services, Inc., to McDonnell Douglas. "When they got sold to McDonnell Douglas, [Bradford] didn't tell [McDonnell Douglas] about our contract. The first comment from McDonnell Douglas was, 'Who are you guys?' " Ligoretti said.

Bradford Charges

In its statement, Bradford charged that Professional Community's "inability to decide upon and communicate its specific needs of the data processing system, as well as its inability to retain the manpower necessary to convert data, created hardship for Bradford."

Bradford did not answer charges that it withheld information from McAuto during the sale of its time-sharing subsidiary, but said it "observes that the alleged incompletion of contract occurred after McDonnell Douglas purchased the contract, in 1981, as part of [Bradford's] former systems division."

Although Ligoretti denied that a suit has been filed, Bradford also said it has "initiated a separate lawsuit . . . to recover statutory damages for violation of California law prohibiting illegal tape recording of telephone conversations. This surreptitious taping of telephone conversations between Professional Community Management and Bradford employees was initiated by Professional Community Management through one of its officers, Anthony Ligoretti."

Professional Community Management is now performing its accounting manually while it awaits a trial. Last July, the Central District Court of California struck down a request from Bradford National that Professional Community Management's case be thrown out of court.

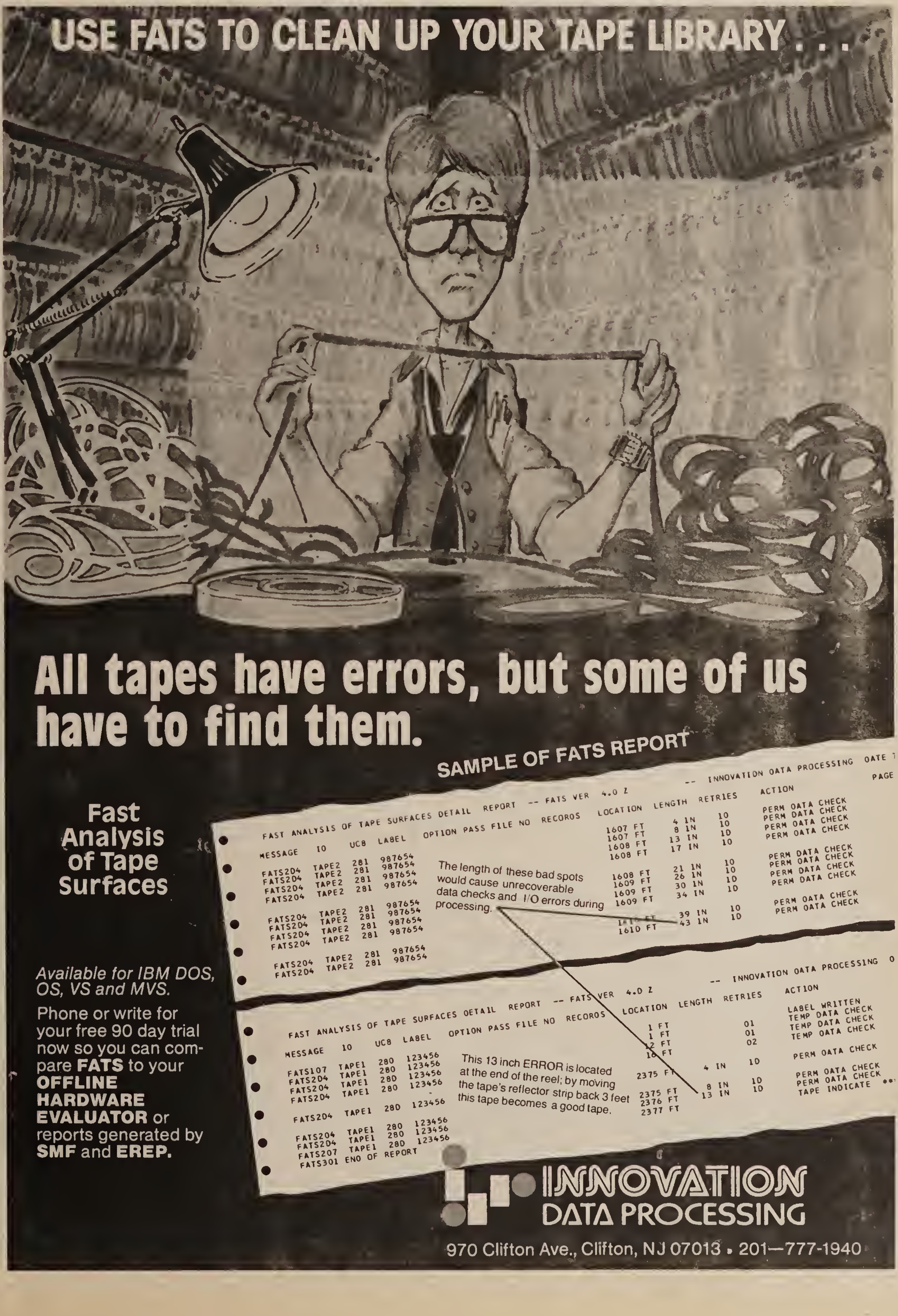
The damages of $53 million include out-of-pocket expenses to investigate the allegedly unwritten programs and direct and punitive damages.

London to Host Info Meet Dec. 6

ABINGDON, England — The Seventh Annual International On-Line Information Meeting will be held Dec. 6-8 at the Cunard International Hotel in London.

Sponsored by Learned Information Ltd., the main event of the meeting will be the conference, which will feature papers covering major aspects of on-line information retrieval. Subjects will include downloading, full-text data bases, microcomputers, in-house information systems, chemical substructures, education and training, electronic publishing, data base industry and videotex.

Further information is available from Learned Information, Besselsleigh Road, Abingdon, Oxfordshire OX13 6LG, England.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Supercomputing Seen Key to Economic Success

By Jake Kirchner
CW Washington Bureau

GAITHERSBURG, Md. — The so-called "supercomputer race" is not just a contest for national technological supremacy; it is a struggle to ensure the U.S.' future economic success, according to Dr. Ruth M. Davis, former director of the National Bureau of Standards' Institute for Computer Sciences and Technology (ICST).

"We're losing sight of the fact that we need supercomputing for entirely different objectives than technology," Davis said last week. "The race we're really in is between countries, not for supercomputers, not for national security. . . . We're in a race to control the resources of the world, both natural resources and informational resources."

After leaving her ICST post in 1977, Davis served in the U.S. Department of Defense (DOD), where she initiated the current DOD Very High-Scale Integrated Circuit Program, and the U.S. Department of Energy. She is now president of Pymatuning Group, Inc., a technology management corporation.

She made her remarks on supercomputing at last week's conference here of ICST and the Federation of Government Information Processing Councils. Reviewing the current U.S. projects on supercomputing, Davis noted there are a number of separate but related programs in both government and the private sector.

"There is a very close bond" among the initiatives begun in the last five years, she said, such as those of DOD's Advanced Research Projects Agency, the National Science Foundation, the Department of Energy and the National Aeronautics and Space Administration. There are other government programs, of which she suggested "it's worth coalescing a lot of the government efforts that are less than critical mass" into a more coherent program.

In the private sector, she singled out three undertakings that are likely to have "enough critical mass" to contribute to supercomputer development. The research plans of Microelectronics and Computer Technology Enterprises, the 13-firm research and development consortium founded by Control Data Corp. (CDC) Chairman William Norris, could lead to "a superb set of technologies that are feeder technologies into the supercomputing world," she said.

The Semiconductor Industry Association's Semiconductor Research Corp. "hits the bottom end of that pipeline from research to marketplace products" by supporting universities and research institutions, according to Davis. Of the new CDC supercomputer spin-off, ETA Systems, Inc., Davis suggested CDC technology and financial support, plus the entrepreneurial approach of the new firm, may or may not prove successful. But, she added, "I am 100% supporting it."

Addressing this broadened and intensified drive to promote supercomputer development in the U.S., Davis noted that a number of recently and almost-completed studies on the subject have come up with a "commonality of recommendations." These include government funding, guaranteed government purchases of supercomputers and an interagency coordinating committee.

A guaranteed market for future supercomputers is essential, Davis said, noting estimates of a combined U.S. and Western European government market of as many as 100 to 120 supercomputers. Although she did not directly endorse a recommendation that the U.S. government buy the first three of any new supercomputer, Davis did say that "I don't know what the industry can realistically do if it has to take all the front-end risks and the down-side risks."

Among her other concerns, she said, is that "we're looking at the supercomputing area as a race. . . . That may have totally obscured the real problem. For example, I'm not sure what the finish line is. I'm not sure how to tell when we have won the race or lost the race." According to Davis, computers will never be fast enough. "It's like high-energy physics: If we're there, it ain't high energy; if we're there in computers, it isn't supercomputers."

The real object is not to advance technology, but to be able to control the discovery, development, management and dissemination of natural and information resources, which can only be done with computers, she said.

In trying to reach that goal, the U.S. needs to help the research community and make some sense of current methods of government/industry cooperation, which she described as currently "back door." The economy is no longer rife with robber barons that require government control, she said, stating that we need a "much stronger emphasis on legislative reform . . . to reflect this U.S. government/industry change.

Tops Nuclear Proliferation

Privacy Ranks High in Canadian Concerns

By Jake Kirchner
CW Washington Bureau

LONDON, Ont. — A recently published survey of 210 Canadian households found that personal privacy is of greater concern than the spread of nuclear weapons. Most worried of all were those with knowledge of electronics, the survey found.

The study, conducted for the Ontario Ministry of Transport and Communications, found that although Canadians are more worried about inflation, unemployment and crime in the streets than privacy, the respondents rated privacy more important than freedom of speech, freedom of the press, sexual equality and minority rights.

"Concern for privacy is very high," reported the study's author, Prof. Neil Vidmar from the Department of Psychology at the University of Western Ontario.

"Sixty-eight percent of the people interviewed believe Canadians have less privacy than [they did] 10 years ago, and 62% indicated they are concerned about threats to their personal privacy," the study said.

"People are concerned about how government uses the personal information it collects about Canadians, but they trusted private business even less," according to the poll results. "There is a widespread belief that many public and private organizations collect more information than is necessary."

Whereas more than one in four Canadian households reported they were victims of significant privacy invasions in the past 10 years, a far greater number said they expected to be victims in the next five years. The study said that 55% expected the invasion to come from a computer or data bank, 58% from a credit rating agency, 51% from an insurance company, 52% from the federal government and 50% from a bank.

"People who reported knowledge of microelectronics technology were those most likely to anticipate the likelihood of a privacy invasion," the report stated.

The study was prepared in conjunction with a research project on privacy in two-way cable television services. The opinion poll found that "people are generally enthusiastic about many of the services that could be provided by two-way cable television, but they are concerned about potential privacy violations due to the amount of personal information that could be compiled by cable companies."

Seventy-two percent of those polled said cable TV company data collection should be regulated by government; only 17% trusted the companies to regulate themselves. "Overwhelmingly, people believe that cable companies should tell subscribers what information is being collected about them and that written permission from individuals should be required before any data can be collected," the study said.

"In fact," it said, "there is substantial support for the proposition that the collection of identifiable personal information by cable companies should be forbidden."

The main study in the project, titled "Protecting Privacy: Data Protection in Two-Way Cable Television Services," noted that the systems will involve "the production and collection of a great deal of personal information about subscribers and other users."

This, according to the study's author, Prof. David H. Flaherty, who teaches history and law at the University of Western Ontario's Privacy Project, "has the potential for becoming a significant barrier to consumer acceptance of such services, if concerns for privacy are not alleviated in advance."

Flaherty recommended that Canadian cable TV companies and the Canadian Cable Television Association adopt privacy guidelines similar to those already adopted by some firms in the U.S. These guidelines, such as those recently promulgated by the U.S. Videotex Industry Association, call for disclosure of record keeping practices, strong security measures and nondisclosure of personal information without advance authorization [CW, July 11].

University to Study Social Effects of Tech

BOSTON — Aiming to help understand the social implications of emerging technology and to assist in the formation of national policy in this area, the Center for Technology and Policy at Boston University opened its doors this month.

Under the direction of Dr. J. Herbert Hollomon, the center hopes to achieve these goals through research, report writing and consulting and the development of an educational program that will consist of workshops and degree programs.

According to Prof. Gerald Gordon, co-director of the center, one of the characteristics that makes the center at BU different from other recently established technology-oriented research centers is the mix of people involved there.

"The problem with academic settings, for the most part, is that very often you have people that don't know what's going on in the real world. . . . We have people who have worked in the real world, in universities, people who have been in senior policy positions, people from government . . . scholars," Gordon said.

The center at BU also has a charter that states that "the center has the right to develop graduate courses and to be an integral part of the university rather than a peripheral unit," Gordon said.

According to John Hansen, assistant professor of research and technology, the mandate of the center includes developing a master's degree level program.

"Though the shape of the program hasn't been formed yet, it might begin sometime next fall with course offerings related to technology management, teaching innovation, policy analysis and science and technology policy. The program will be for people interested in technology, technology policy and management of technology, whether these individuals presently work in the field or they're students interested in those fields."

Some of the areas of research that will be examined at the center are the effects of factory automation on workers and management, the implications of technology on social policy, the impact of computers on manufacturing and forecasting technical labor markets.

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SYSTEMS & SOFTWARE,
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News

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As appeared in
BUSINESS WEEK,
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Sidereal Takes Wraps Off Multiuser Info System

CW at TCA '83

By Jeffry Beeler
CW West Coast Bureau

SAN DIEGO — Up to 12 communications lines, protocols and interfaces can be supported simultaneously with a multiuser office information system introduced here last week by Sidereal Corp. at the Tele-Communications Association (TCA '83) conference.

The management of Micronet 85's data communications activities takes place in the background and thus remains entirely transparent to the system's users, a spokesman said.

In addition to performing all the necessary speed, protocol and code conversions automatically for a multiline system, Micronet 85 boasts a user interface reminiscent of Apple Computer, Inc.'s Lisa personal computer.

The Micronet Operators' Environment interface provides users with six global commands and a series of screen-displayed icons that represent familiar office fixtures such as filing cabinets, folders, documents and in-baskets. By selecting the right combination of icons and global commands — which include Open, Close, Move, Copy, Delete and Execute — users can perform practically the full spectrum of file maintenance and communications functions.

The use of a Lisa-like interface minimizes the need to enter long command sequences, simplifying user training and making Micronet 85 easy for a nontechnical office worker to operate, he said.

Like Lisa, the Sidereal system reportedly allows multiple windows to be displayed on one screen at the same time, with each window capable of independently executing a different application. Because the system's standard application packages are all integrated, data can be automatically transferred from one window to any other, the source said.

Micronet 85 is built around a Motorola, Inc. 68000-based controller that supports up to four workstations through a coaxial cable link. Using the controller, each workstation has equal access to a common disk system, up to five shared printers and a maximum of 12 communications lines, the spokesman said.

As many as 256 controllers can reportedly be tied together either remotely, through a High-Level Data Link Control (HDLC) protocol, or locally, through MIC-Link, Sidereal's local networking facility. The HDLC protocol allows the workstations to be installed as far as 1,000 feet from the nearest controller.

Expected to compete directly with office information systems from companies such as Fortune Systems, Inc. and Convergent Technologies, Inc., Micronet 85 operates with M-Stos, Sidereal's Unix look-alike operating system.

Micronet 85 is said to support a wide variety of communications capabilities and facilities, including:

- The major electronic funds transfer networks used by the banking industry.
- All the protocols required for telexing and interfacing with international record carriers.
- Compatibility with host mainframes through IBM 2780, 3780 and 3270 emulation.
- The X.25 communications standard.

A fully expanded Micronet 85 incorporates a controller with a CPU, 1M byte of random-access memory and 80M bytes of disk storage. A basic system with a 512K-byte processor and a 5M-byte disk module costs $19,500 and will be available in October from Sidereal at 9600 S.W. Barnes Road, Portland, Ore. 97225.

Voice, Data Fight Forcing Merger?

(Continued from Page 1)

Angeles-based California Federal Savings and Loan. "But the technology will bring them together."

One communications manager said the voice will become the dominant technology simply because of its mass use. "Eighty percent to 90% of all communications is voice," said Thomas D. Graham of the Communications Systems/Information Systems Department of Rockwell International Corp. of Anaheim, Calif.

But another manager of voice communications at a major insurance company disagreed. "The data side will take over voice because they have been keeping up with education; in my company, data gets all the money they need for education, while I'm hand-training my operators."

The telecommunications manager also said that the bitter battle will not be settled for at least 10 years. "Our voice and data people aren't going to merge very easily," she said.

But Robert Justham of telecommunications planning in California's Department of Motor Vehicles is already planning for the integration of the two networks. "Our concept is to have voice and data in the same [departmental] unit," he said. "With the divestiture of AT&T, we're forced to create our own voice network."

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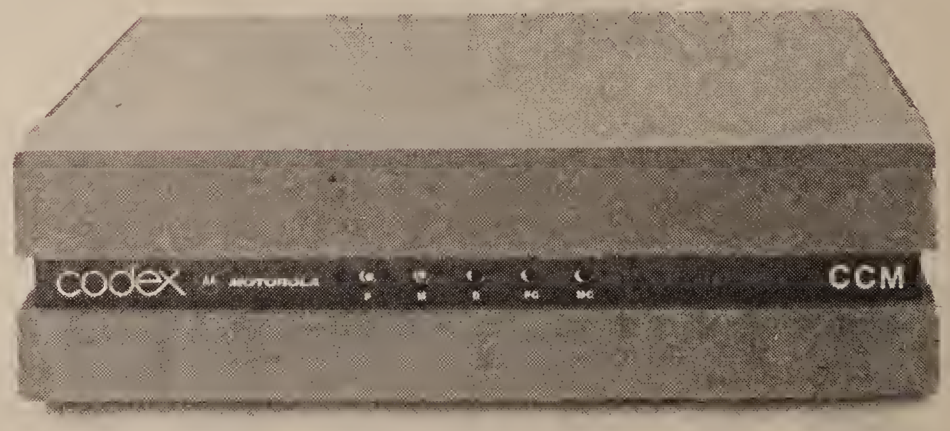

Two More Hopefuls Join PBX System Ranks

By Jim Bartimo
CW Staff

CW at TCA '83

SAN DIEGO — With some 85 private branch exchange systems (PBX) already on the market from some 25 vendors, at least two more were added to the list here last week at the Tele-Communications Association annual meeting (TCA '83) here.

GTE Business Communications Systems, Inc. added to its Omni line of PBX systems with the introduction of the GTE Omni SIII said to switch both voice and data. With a capacity of 2,048 voice and data lines, the PBX can interface with local-area networks and public packet-switched data networks.

The Omni SIII uses a dual-bus architecture that permits high-speed communications over existing single twisted-pair wiring, according to a vendor spokesman.

Shipments will begin in February at an average cost of approximately $600 to $700 per port.

More information is available from GTE at 12502 Sunrise Valley Drive, Reston, Va. 22090.

Harris Corp. added another PBX to its line of switches with the introduction of the Harris 400 PBX. Said to switch digital data at 9,600 bit/sec up to 4,000 feet, it also offers disk-based software.

The switch can direct calls to the least costly route, collect call information for pricing and processing with a personal computer and link at multiple sites to provide a company-wide network, a vendor spokesman said.

All system parameters can be entered and changed for the Model 400 with a menu-driven personal computer — either locally or from a remote location. Available in January, the PBX will cost approximately $500 per line from Harris' Digital Telephone Systems Division, One Digital Drive, P.O. Box 1188, Novato, Calif. 94948.

A somewhat unusual entry into the product announcement arena was a message storage and retrieval system said to run in conjunction with the IBM Personal Computer. Candela Electronics, Inc. released software and a small printer to bring voice messaging to the microcomputer.

The Can-Print software allows the Personal Computer to store up to 800 messages entered from a keyboard and recalled on the screen. A Message Printer provides users with hard-copy message retrieval. The user pushes a button on the thermal printer to recall all messages, a vendor spokesman said.

The software is available for $350; the printer for $160 from Candela, 550 Del Ray Ave., Sunnyvale, Calif. 94088.

Several facsimile machines were also introduced at the show including those from Canon, Inc.

Canon's FAX-300 series desktop digital facsimile includes the FAX 330, which is said to send a message in 22 seconds. The 330 also features an LCD display that provides information about the party sending or receiving a transmission. The 330 is available for $4,495.

The 320E can enlarge documents by as much as 33% and can also reduce document size. It has all the features of the 330 and is available for $5,995.

Canon is located at 1 Canon Plaza, Lake Success, N.Y. 11042.

Top PBX Item: Can It Get A Dial Tone?

SAN DIEGO — "A lot of vendors are talking about all the features on their PBXs, but the most important feature is to get a dial tone," according to Jerry Wertzer, assistant director of private branch exchange (PBX) engineering for NEC Telephones, Inc.

Speaking at the Tele-Communications Association's (TCA '83) annual meeting here last week, Wertzer explained that a PBX should be measured by how well it establishes connections from one station to another and not necessarily by other available features.

In an attempt to guide the audience in the purchase of a PBX system, Wertzer suggested some questions to ask vendors.

First, switching systems can be judged by one factor in any given installation — the number of simultaneous conversations that can take place. With an eye toward the capacity of the PBX, users should also buy more lines than they immediately need and plan for the future, Wertzer said.

In order to plan for such new PBX features as data switching and voice store and forward, users should ask, "How much memory do I have to add and how much processing power?" Wertzer said.

Once the PBX is purchased, there are additional problems to be solved. For example, integrating voice and data means integrating the voice and data processing departments within the organization, he noted.

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'No Way of Knowing About Logic Bomb'

WASHINGTON, D.C. — The Los Alamos National Laboratory security chief said last week there is no way of knowing whether a "logic bomb" was entered into the lab's computer system by hackers who have accessed the system without authorization.

A logic bomb is a programming command entered without trace in a computer system to perform some function at a later date, possibly including alteration or destruction of the computer's operating system and data files.

"I see no way to guarantee that there is not one," Jim McClary, Los Alamos Operational Security and Safeguards Division leader, told the House of Representatives Science and Technology Subcommitee investigating computer security. "Software verification is a very difficult problem; no one knows how to do it now," he said.

McClary, called on the carpet by the subcommittee, assured its members that there was no breach of security in the computer systems that are used for classified work by the laboratory staff, who conduct nuclear weapons research. The system accessed is an open computing system linking scientific and academic researchers around the country.

Little Loss

The unauthorized access by the "414" gang of computer hackers resulted in the loss of Los Alamos and Telenet computer time worth less than $300, he said. But "the disruption . . . required three to four work-months of effort on the part of system managers and security personnel in establishing exactly what the intruders had done," according to McClary.

Although there was no damage to the system before the laboratory discovered the access and moved to prevent further incidents, according to McClary, "the intruders could have caused confusion, delay and perhaps incorrect results for many users of the open distributed processors," he said.

He also stated that the lab has seen one other intrusion and other unsuccessful attempts since June, when the 414 incident occurred. Those have also been reported to the Federal Bureau of Investigation, he said.

On the subject of security, McClary commented: "We weren't shocked when this occurred. We were disappointed that certain system managers had not changed the passwords [that came from the hardware manufacturer]. The nature of open computing," he said, "is such that things like this are going to happen occasionally."

Subcommittee Grills Hacker

(Continued from Page 1)

country, including those of the Los Alamos National Laboratory in New Mexico and the Sloan-Kettering Institute for Cancer in New York.

Asked by Rep. Bill Nelson (D-Fla.), sponsor of the pending federal computer crime bill, when he first realized this access was improper, Patrick said, "Not until the FBI knocked on my door."

Patrick spent about an hour educating the subcommittee in the ways of illegal computer hacking activities. He said the Telenet access number and the passwords used to access the computer systems were available from electronic bulletin boards used by other hackers.

The access, he said, "is something that just about anyone can do. . . . I don't think any members of the group were geniuses or anything of that sort, but they were above average" in terms of home computer users. He noted that most of the computer systems still were using access codes that came from the factory, including "Test" and "System." Those passwords were ones that opened up the Los Alamos system, he said.

Asked by Rep. Albert Gore Jr. (D-Tenn.) how he was caught, Patrick replied, "I really don't know." Gore then told Patrick the Security Pacific Bank had set a trap for the hackers by offering a Star Trek game to keep them on the line until they could be traced. Patrick quietly said he remembered playing that game for several hours.

Patrick said he got his start in hacking after his father purchased a Radio Shack TRS-80 Model II computer for business purposes. Eventually, he said, "we [the 414 group] wanted to do more than just play around with our home computers" and get some experience working with large mainframes.

The 414s, who took their name from the Milwaukee area code, came together, he said, through a common interest in computers and had no formal organization or leadership. Patrick said he has been hacking for six or seven months and during the summer spent as much as 20 hours a week at that activity. It was, he said, "something to do in the evenings."

Most of the illegal access would have been prevented if the system operators had merely changed the passwords that came with the hardware, he said. "It's very easy to prevent that [access]," he said. "Just commonsense ideas and attitudes would prevent most of this — if not all of this — from happening."

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Consultant Trys Break-Ins to Beef Up Security

Hired Hacker Not New Phenomenon to Geisco

By Tom Henkel
CW Staff

While many firms frown upon the mischief hackers cause in DP operations, a major computer time-sharing firm here has been relying on hackers for years as a way to beef up its security.

General Electric Information Services Co. (Geisco) has had a private consultant trying to crack password codes in its Mark III time-sharing system for better than 10 years.

Geisco hired its private consultant in the early 1970s to iron out security problems in the then new Mark III time-sharing system. Based on Honeywell, Inc. hardware, the Mark III software was developed in-house and geared to a time-sharing environment.

Geisco vice-president of technology operations, Raymond W. Marshall, said the consultant has yet to break into either the Mark III system or the more recently developed IBM-based Mark 3000 system. The consultant has, however, been able to identify potential problems.

"He acts as our most intelligent user," Marshall said, noting the Geisco consultant probably knows as much about the Mark III system as many in-house employees.

Attempts Unauthorized Use

The Geisco consultant's job is to use a fairly low-level system access password on the Mark III and IBM-based Mark 3000 systems and attempt to make unauthorized use of DP service, or to gain access to the code for the applications programs available on the two time-sharing services, Marshall said.

To perform his hacking duties, the consultant is given free reign with the firm's manuals and system descriptions that might help him learn enough about the Mark III system to break its security, Marshall said .

"We just let him poke around," Marshall added, noting the consultant submits regular reports on his hacking adventures, including how successful he has been with a particular method.

While noting that neither the hired hacker nor anyone else outside of Geisco has successfully gained unauthorized access to the Mark III or Mark 3000 systems, Marshall said the biggest risk to large systems is from in-house. Geisco also uses a third-party auditing firm, Peat, Marwick, Mitchell & Co., to do a regular independent audit of security measures at Geisco.

He cited the example of a very valued employee who has access to internal passwords in a system. If that employee leaves, especially if under unpleasant circumstances, there is a chance he could either steal information from the system or damage it in some way. The Peat, Marwick, Mitchell audits help to ensure such a user has been locked out of the Geisco system by identifying all passwords assigned to that user. In addition, the audits also help identify passwords that are no longer assigned to valid users, Marshall said.

School Invites Hackers to Break Into Its Systems

SEATTLE — While General Electric Information Services Co. is not inviting anyone with a flair for hacking to try to break into its computer systems, Western Washington University (WWU) here is doing just that.

With more than 30,000 students and faculty members signing onto the school's system each quarter, Joan Hayes, the school's coordinator of academic computing services, said hacking is a way of life.

Instead of punishing offenders, administrators reward students for reporting security problems in the school's Digital Equipment Corp. VAX-11/780 processor. Hayes said rewards usually take the form of more memory for the individual's account.

The school instituted the reward policy back in 1975 when four students managed to break into an earlier Perkin-Elmer Corp. processor.

The major flaw with the WWU policy, Hayes admitted, is it is often unclear whether students caught attempting to break into unauthorized parts of the WWU system are doing so for the good of the university or for personal gain. This is further clouded by the fact that the university has adopted legislation making devious computer hacking a crime.

As long as data has not been lost or altered, Hayes said, the school is usually lenient toward hackers — provided they are willing to cooperate in closing system loopholes. If they do not cooperate, the offender is barred from using the system until he repents. Hayes added, the policy only applies to bona fide internal system security problems. Students who steal passwords, for example, are treated much more harshly.

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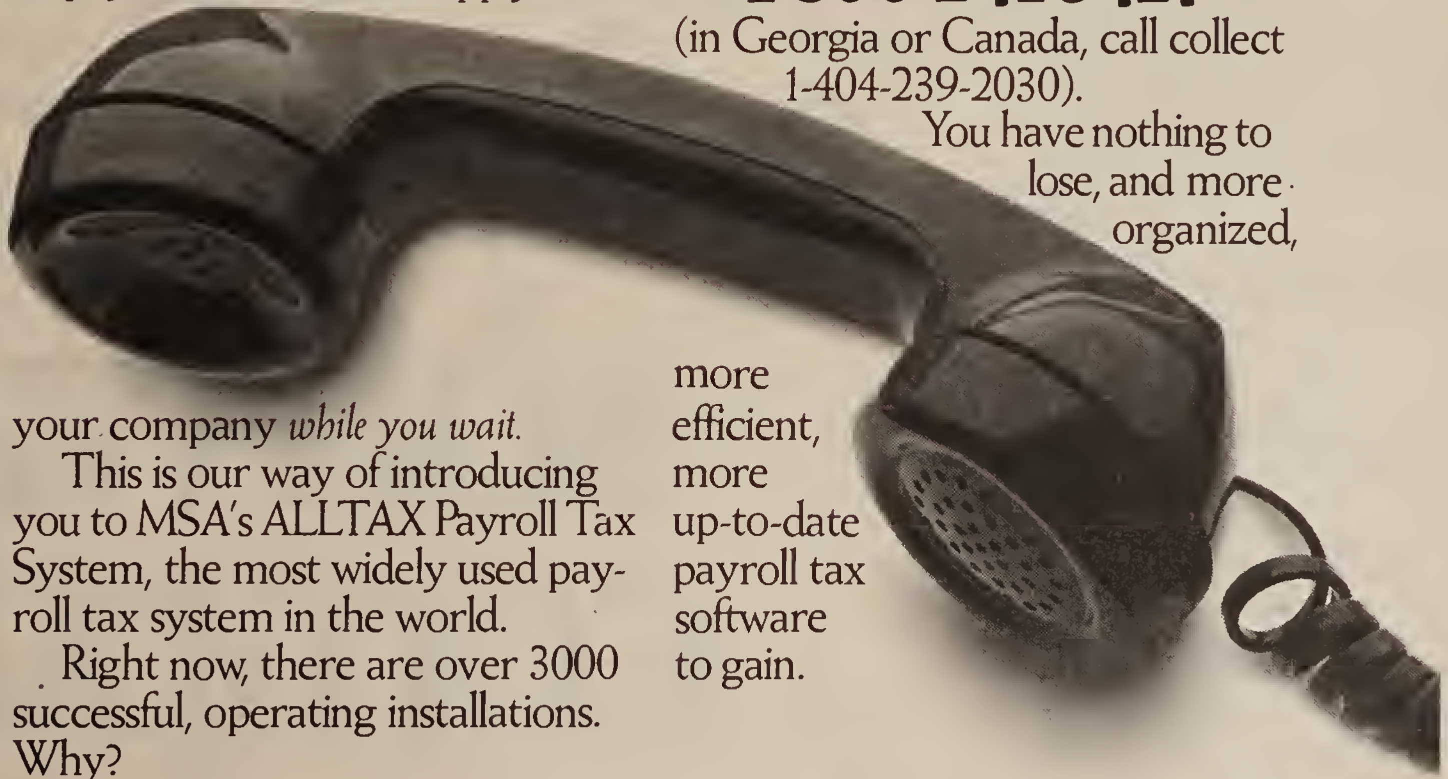

Attempted Robbery Foiled by 'Midas' Touch

By Peter Bartolik
CW Staff

CLINTON TOWNSHIP, Mich. — Midas did not provide the golden touch for an alleged thief apprehended here recently.

Midas is an acronym for Multiple Listing Information Data Assistance System, the user-written software for an on-line system connecting more than 100 real estate agents with the Macomb County Multiple Listing Service (MLS).

The alleged con artist/thief was nabbed in a real estate office here recently after an employee read the culprit's description in the MLS system's electronic mail.

William Lawson is being held in lieu of $10,000 cash surety and faces 10 outstanding warrants in addition to the larceny charge filed here, according to a police detective who described Lawson as a "local con man."

According to Virginia Easton and Phil Hogan of the MLS center in St. Clair Shores, about 10 miles from here, a thief had been fleecing real estate agents by posing as an executive looking for a house and then robbing the real estate personnel.

"He was going into real estate offices and saying he worked for the GM [General Motors Corp.] Technical Center in Warren and that he was looking for a home in the $150,000 to $175,000 range," Easton said. When the agents left the room to check listings, the man would rifle through purses and flee.

The robberies had reportedly been going on for about two or three weeks, Easton said. After a pattern became apparent, the MLS put a message on its on-line system, providing a description and warning real estate offices to be on the alert.

On Tuesday, Sept. 20, when Lawson walked into the Re-Max Real Estate Co. office here, one of the agents in the office was looking at the terminal and read the message.

The MLS, which carried the crime alert, serves 275 offices in the county, 127 of which are connected on-line to the service's Stratus Computer, Inc. Stratus/32 superminicomputer, Hogan said.

The police were immediately called and secretly observed Lawson's actions from another room. When the agents left the office, Lawson allegedly was seen going into an employee's purse and was apprehended.

Police said two charges have been lodged and that Lawson has said he may have committed five similar crimes. Lawson technically already faces a prison escape charge because he was arrested while assigned to a halfway house after serving seven months of a three- to 14-year prison sentence for writing bad checks.

San Diego Man Pleads Guilty In Fraud Case

By Patricia Keefe
CW Staff

ATLANTA — A 22-year-old San Diego man pleaded guilty last Monday in the U.S. District Court of Northern Georgia here to charges that he posed as a representative of a major industrial corporation and fraudulently ordered a microcomputer system.

Last January, Brian A. Graves reportedly used the guise of a General Dynamics Corp. representative to order a Vector Graphic, Inc. Model V4/30 microcomputer.

In return for his plea, the U.S. District Attorney's office here has agreed to recommend a sentence of five years. If he had not entered a guilty plea and was found guilty, Graves could have been sentenced to 10 years in prison, according to U.S. District Attorney Richard Dean. Sentencing for Graves was scheduled for last week. Although Graves pleaded guilty to the January incident, it is allegedly not the first time he has posed as a General Dynamics executive or fraudulently ordered computers or computer equipment.

In fact, he was arrested June 23 in Jacksonville, Fla., when he allegedly attempted to pick up another computer valued at more than $4,000, according to Federal Bureau of Investigation Special Agent Doug Jones. That computer was allegedly shipped by Teleram Communications Corp., although officials of the White Plains, N.Y., firm expressed no knowledge of the fraudulent order.

Graves also allegedly attempted to place other orders — some for as much as $10,000 worth of computers and parts — from computer suppliers. In each case, he reportedly used various aliases, all fictitiously identified as employees of General Dynamics. Whether Graves was successful in picking up any of these alleged orders and what he is supposed to have done with the computer equipment are not known.

To date, the alleged felon has only been indicted on the January incident, District Attorney Dean said. Dean would not comment on the possibility of other indictments involving Graves.

Graves' attorney, Michael McIntyre, declined to comment on the case other than to confirm Graves' plea.

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But Not Enough to Win Game

System Helps BC Football Coach Call the Plays

By David Myers
CW New York Bureau

CHESTNUT HILL, Mass. — Computers can do a great many things, but they cannot block and tackle.

That was the story when 15th-ranked Boston College (BC) fell to eighth-ranked West Virginia University on the Alumni Stadium turf here by the score of 27-17 on Sept. 24.

The showdown between the two eastern powers had been building up as a test of computers in college football since BC uses an IBM 4341 to set its strategy while West Virginia sticks with the time-hallowed method of doing things by hand.

Jack Bicknell, head coach at BC, told *Computerworld* in a pregame interview that the Eagles depend on the mainframe for "everything we do."

West Virginia, meanwhile, has an Amdahl Corp. AS7 mainframe on its Morgantown, W. Va., campus, and the university's data specialists have assured Mountaineers' head coach Don Nehlen it would be no problem to program the computer to comb through scouting reports and offer strategy.

So far, however, the Mountaineers have made use of the computer only in recruiting high school athletes.

BC, by contrast, feeds its on-campus mainframe a mountain of scouting reports on its next week's foe. The computer then spits out an analysis of the team's play selection.

"It tells us what to expect from them on first and 10, or second and long or third and inches," Bicknell said. The BC coaching staff uses the information to array its defenses.

But more than that, the Eagles use the computer week by week to scout themselves.

"We want to know what our opponents are looking at when they look at us. What we're trying to do is make sure we don't have a lot of tendencies. We don't want to be predictable. We use it [the computer] in planning our attack," Bicknell said.

But Bicknell added that his squad's computer tactics, marshaled by Brian O'Connor — a local high school teacher — are nothing rare. "All colleges are into computers," Bicknell said. "They give you a more complete look and a lot more concise information than you could ever get through the old-fashioned way of compiling reports by hand."

Actually, Bicknell was wrong. West Virginia does not use a computer in its football program.

"We're looking into it. We want to do it. We have all the same data our opponents have. All we need to do now is speed up the process," assistant coach Donnie Young said.

A lack of manpower in the school's DP center has left West Virginia lagging behind its Saturday opponents in appointing a computer to its football brain trust.

"We've got the talent, and I've been encouraging [the coaches] to pursue it. But so far, I guess they haven't had the time," Dan Ord, an administrative data specialist, said.

Even so, the West Virginia coaches said they were not afraid their foes' computers give them an advantage. "In football, there's just so much data you can use," Young said.

Helps Coaches Prepare

Bicknell agreed the computer "is not going to help your kids play. But it is going to help your coaches prepare," he insisted. And the computer printouts on West Virginia had given his staff a complete familiarity with the Mountaineers by game time.

All the beautiful clear logic of the Eagles' computerized game plan was scrambled when BC lost its leading ground-gainer and the ball on the opening kickoff.

Starting tailback Troy Stradford was knocked momentarily unconscious and fumbled the football at his own 16-yard line. West Virginia recovered, scored just over a minute later, and for the rest of the afternoon, BC was forced to play catch up.

But as one college coach told CW privately, "Sometimes it [computer strategy] holds up, and sometimes it doesn't."

GSA Appoints Reeder as Chief Of DP Group

WASHINGTON, D.C. — The U.S. General Services Administration (GSA) has announced that Franklin S. Reeder has been appointed chairman of the Interagency Committee on Automatic Data Processing for 1983-84.

Reeder, a member of the information policy staff of the Office of Management and Budget, succeeds former chairman Reed Phillips of the Department of the Interior, who resigned from government service to work in private industry.

The committee, sponsored by the GSA under executive order, prepares position papers and makes recommendations for improving automatic DP within the U.S. government.

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DOD Calls Access Charge Threat to U.S. Security

By Jake Kirchner
CW Washington Bureau

WASHINGTON, D.C. — The U.S. Department of Defense (DOD) last week reiterated claims that the effects of telecommunications deregulation, particularly the Federal Communications Commission's (FCC) controversial access charge decision, jeopardize national security.

The breakup of the AT&T system and pro-competitive FCC actions, by increasing the number of communications carriers the department will have to deal with, will create special burdens on DOD communications planning, the DOD said. In addition, the access charge could seriously raise the costs to the government for defense communications, according to the DOD, which spends more than $1 billion annually for commercial communications services.

"I cannot overstate the significance of the impact upon us, from a cost, management and operational standpoint," Lt. Gen. Winston D. Powers, director of the Defense Communications Agency, told the House of Representatives Government Operations Subcommittee on Government Information, Justice and Agriculture last week. The subcommittee was continuing a series of hearings on the FCC's access charge decision.

The access charge would initially add $2 a month to residential phone bills and $6 to businesses. The charge is meant to make up for the lost long-distance subsidies to local telephone rates under the telephone system that will go out of existence at the end of the year when the reorganization of the Bell system is complete.

Spate of Bills

A spate of bills in Congress would alter the access plan; one proposal would add charges for bypass systems to help subsidize universal telephone service. Efforts to produce a bill acceptable to a wide spectrum of legislators and the public have been unsuccessful so far. The Senate Commerce Committee failed last week to draft an acceptable bill, although a proposal to delay the access charge for one year gained ground; the House Telecommunications Subcommittee, which is having similar difficulties, is slated to take up the effort again this week.

Representatives of the Florida and Michigan public service commissions told the government information subcommittee last week that the access charge could easily lead to a doubling or tripling of consumer telephone rates. This would result in several hundreds of thousands of people in every state being forced to give up telephone service, they claimed.

The Defense Department has been uneasy about telecommunications deregulation for some time and has attempted to derail or limit it.

Deregulation and related FCC decisions, the DOD's Powers told the subcommittee, "mean higher costs of obtaining service and increased manpower costs for the DOD, both in the short term and in the long run, no matter how well we communicators do our job. Indeed," he added, "I believe that most of these decisions simply do not adequately account for the problems of a nationwide communications customer with the unique needs of the DOD."

With many of these changes imminent, the government does not have the money budgeted to pay for what it expects will be significantly higher telecommunications costs, warned Donald C. Latham, deputy under secretary of defense for communications, command, control and intelligence.

The situation is also of concern to the civilian federal agencies, but Frank J. Carr, assistant administrator of the General Services Administration (GSA), said it is impossible to predict accurately how the agencies will be affected. Carr, who heads the GSA Office of Information Resources Management, which has governmentwide responsibility for computer and communications procurements, said conservative estimates are that these agencies will spend between $37 million and $40 million more in 1984 alone.

Dbase II Meet Set for Nov. 10 In Long Beach

CULVER CITY, Calif. — Users of Dbase II will have their "Dbase II Runtime: Key to Success" conference aboard the Queen Mary Hotel in Long Beach, Calif., Nov. 10-12.

A keynote speaker will be Edward A. Feigenbaum, professor of computer science at Stanford University and coauthor of *The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge to the World.*

Sponsored by Ashton-Tate, Inc., vendor of Dbase II, the conference will include keynote speakers, panel sessions, seminars and technical workshops aimed at providing Dbase II users and developers with technical expertise, start-up business advice and marketing assistance.

Registration for the conference is $350. Further information is available from Ashton-Tate, 10150 W. Jefferson Blvd., Culver City, Calif. 90230.

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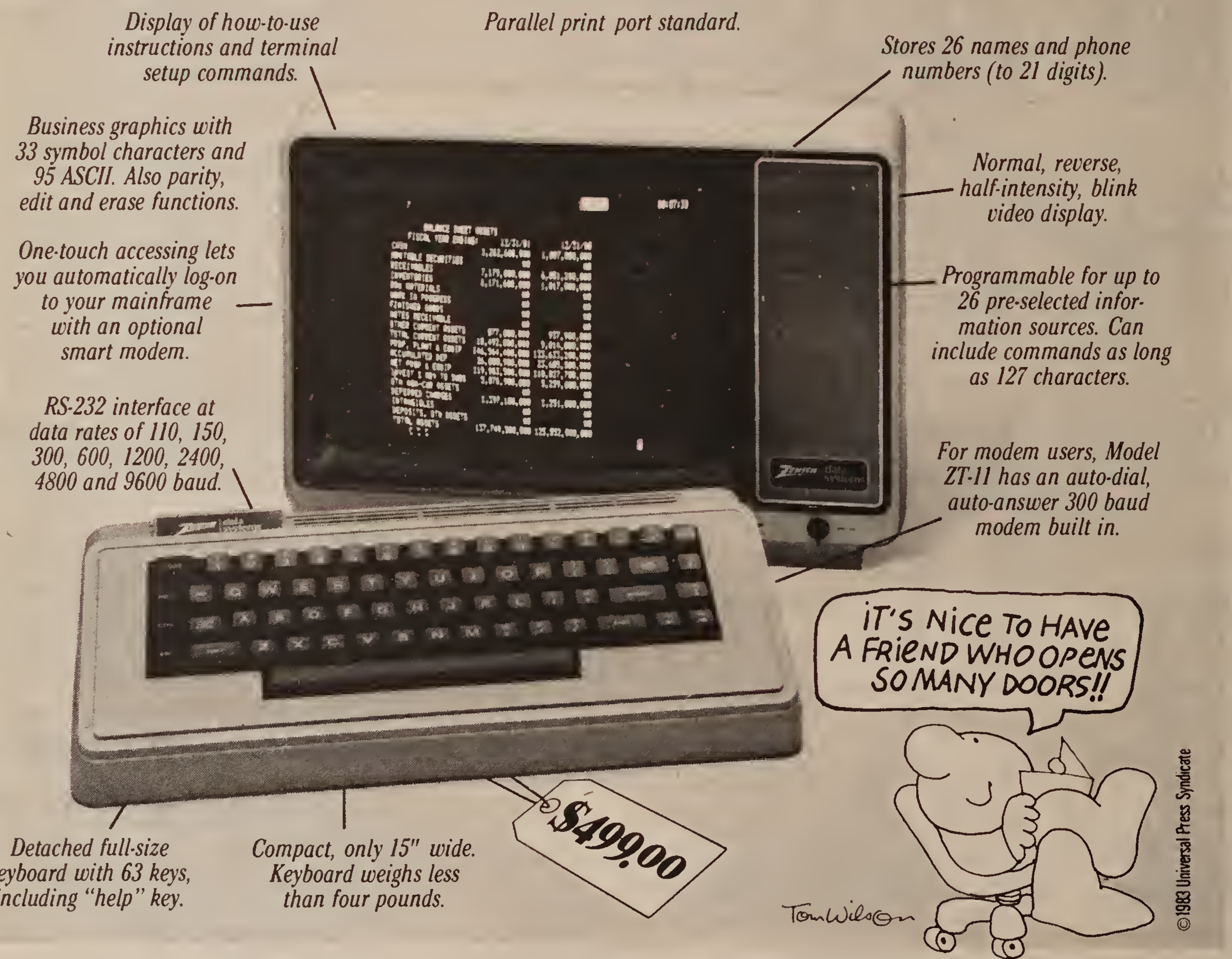
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Facing Increasing Poverty Gap

Computer Literacy Seen Key for Black Workers

CW at
BDPA

By Peter Bartolik
CW Staff

NEWARK, N.J. — Black Americans face an increasing poverty gap if they don't strive to become computer literate, a black physicist told the Fifth National Convention of the Black Data Processing Association (BDPA) here recently.

Prof. Chandler Dennis, physics professor at Stockton State College in New Jersey, told BDPA members meeting here recently that their future is "encouraging" because of industry demands. But for most blacks, he added, "There's a revolution going on, and we're not part of it."

He said blacks hold 10% of the skilled, manual jobs at mainframe sites and 8% of programming jobs. "Those are the kind of ratios we want to see," he said.

Promotion Prospects Good

Promotion prospects for "blue-collar workers of the future" are good, according to Dennis, particularly because the industry is generally not hampered by unionization, which he said has tended to hold back minorities.

However, he added, "My research has indicated that black folks are not particularly computer literate" and face potentially severe unemployment problems as robotics eliminates the need for nonskilled production workers, of which "we comprise a disproportionate share."

He urged BDPA members to serve as role models for young blacks and to encourage early development of computer skills in poor schools. If computer literacy is not strongly encouraged, he concluded, blacks generally "will become economically obsolete."

In keeping with the conference theme, "Rise to the Challenge" — inspired by a speech delivered by Martin Luther King in 1962 — blacks already involved in data processing were encouraged by Dennis and other speakers to hone their professional and interpersonal skills to take advantage of shortages in the data processing field.

Interpersonal Skills

Len Myers, vice-president for technical operations at Computer Horizons, Inc., a consulting firm, told BDPA members that the most important requirement for budding black DP entrepreneurs is the development of interpersonal skills.

"When you can't communicate, you cease to exist," he said. Myers said blacks have to develop professional credibility to obtain contracts.

Robert Davis urged BDPA members to seek out professional "networks" to enhance their careers and to seek out mentors to improve their prospects.

Davis was a Sloan Foundation fellow at MIT in 1978; he is presently director of administrative services and facilities with AT&T's Central Services Organization in New Jersey.

A powerful asset not to be overlooked in the DP industry is the ability to write well, according to Bessie William, manager of General, Small and Office Systems Support for IBM's Federal Systems Division in Washington, D.C.

Writing, she said, "gives you an opportunity to influence many people, some that you don't even see."

BDPA Issues DP Challenge To U.S. Industry

By Peter Bartolik
CW Staff

NEWARK, N.J. — The Black Data Processing Association (BDPA) is challenging U.S. industry to increase productivity through automation. In line with that challenge, it is developing its own strategies to bring computer skills, which could then be used as a resource, to the general black population.

"In order to survive, American business needs to increase productivity and improve the quality of its products and make a long-term commitment to growth. Failure to do any one of these things will result in the death of that business or that industry in America," said Gerard Anderson, coordinator for the BDPA's fifth annual meeting held here recently and a systems engineer with IBM.

For the past few months, Anderson has been traveling throughout the country as a representative of the BDPA's education committee.

Anderson's message is twofold. First, he said, "I'm trying to get blacks in DP to understand the pressures on American business and the effects of foreign competition."

The rest of the message deals with "how blacks in the DP industry have the responsibility to be as produc-

(Continued on Page 18)

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CW Photo by P. Bartol

Kenneth Russell

BDPA Members Discuss Backgrounds

By Peter Bartolik
CW Staff

CW at BDPA

NEWARK, N.J. — Deborah Watson knows where she is going. Kenneth Russell knows what it's like to get there.

Both are members of the Black Data Processing Association (BDPA), and during that organization's fifth annual convention here recently they told *Computerworld* of their experiences and goals in the DP industry. While their goals are somewhat similar, their experiences with racism in the industry are quite different; Russell said his skin color has not adversely influenced his career, while Watson said she has experienced discrimination because of both race and sex.

Watson is a senior analyst/programmer with Smithkline Beckman Corp., a pharmaceutical company located in Philadelphia and has a firm idea of where she would like her career to evolve. "Within the next five years, I'd like to be in Smithkline's management; within 10 years, I'd like to have my own business," she said.

Russell already has his own business, Information Systems Consultants in Cleveland, a partnership he entered into with another BDPA member he met during the organization's first convention in 1979.

Prior to that he had worked in several Cleveland-area businesses, starting off as a computer operator during a transition from an IBM 1401G to an IBM 3160

(Continued on Page 19)

BDPA Offers Strategies For Change

(Continued from Page 17)

tive, as responsible and as resourceful as anyone else in the business," he said.

Automation, according to Anderson, is the most efficient way for business to increase productivity; but, as many speakers at the convention noted, it is also potentially most threatening to the many blacks who work in nontechnical manufacturing jobs that may be eliminated by the increased use of robotics.

BDPA members are apparently fully aware of the effect their efforts may have on the black population in general. To create more jobs for blacks, "we must help American business stay on its feet to remain competitive and move ahead," Anderson said.

Pointed Strategy

It is a pointed strategy for blacks in DP: "We acquire a can-do attitude that we can take back to the black community and motivate those who are still struggling there to move ahead and fill our shoes," Anderson said.

Each of the local BDPA chapters has established and is developing programs to bring to the black community the skills of computer literacy.

The BDPA, therefore, has three tasks, according to Anderson: It must help blacks in DP to advance their careers; bring the age of computers to the black community; and help the DP industry make advances that will increase competitiveness and thereby produce more jobs in America.

Those sentiments, from a quite different perspective, had been voiced at the start of the convention by Newark's black mayor, Kenneth A. Gibson, who delivered the welcoming address. "We need your talents, your experience and knowledge and growing knowledge."

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And Career Decisions, Look to Future

(Continued from Page 18)

and progressing to programmer and then to systems analyst. Along the way he acquired experience in communications and in data bases. "Data base experience made me valuable," he said, and led to consulting.

Watson started her career with an insurance company in 1968. After 13 years with three insurance companies, she felt her career prospects were limited, and she moved to Smithkline, where she now works in a shop with an IBM 3031, IBM 3033 and some personal computers.

She has also started a part-time consulting firm, Computer Information Management Systems, offering computer literacy services. "Eventually I want to start my own consulting firm to offer DP skills to small businesses in the area," she said.

Russell already had contacts in the private sector when he formed his partnership, which "had two people who were marketable and who could generate revenue." The firm has grown to seven people and two offices, and growth required a structured marketing effort, he said.

The partnership offers DP services in data distribution, systems analysis and programming. Last year "was bad for everyone" in consulting, he said, and the firm added an aspect he believes will level off the cash flow sheets "that looked like mountain ranges."

He has established a dealership with Nippon Electric Co. marketing microcomputer systems and developing integrated software in such areas as dental office management, school administration, wholesale distributorships and others.

Being black has not placed extra obstacles in his path, Russell said. "I consider myself as a black in business, not a black businessman." The challenge, he said, is being an independent businessman.

Cash flow is the toughest problem facing independents, according to Russell. Seeing unlimited opportunities opening up in this decade with the increasing availability of computer hardware, "The challenge is how to grow as fast as possible with the money available to you," he concluded.

Watson said she has felt discrimination in the industry. When she started her career, "There was a push to get black women — because they fit two [affirmative action] categories — into higher positions, so we moved very rapidly," she recalled. In the late '70s the atmosphere changed, and she felt limited career opportunities in the "basically structured" insurance industry.

"It's difficult sometimes proving yourself to a white male manager; it's not only black women who have problems but also white women," she said.

CW Photo by P. Bartolik

Deborah Watson

San Diego To Sponsor Net Meet

SAN DIEGO — Broadband local-area network technology will be the topic of the second local-area network conference sponsored by Sytek, Inc. and San Diego State University (SDSU) here Nov. 8-10.

The three-day conference will apply classroom techniques to network systems evaluation, design, implementation and control, using the university's broadband local-area network as a model.

Registration for the conference is $675 in advance or $750 on the first day of the conference. Additional information is available from SDSU/Sytek Conference at 1225 Charleston Road, Mountain View, Calif. 94043.

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Programmers Told to Develop Skills in DBMS

By Peter Bartolik
CW Staff

NEWARK, N.J. — "You won't have jobs unless you understand data base management systems [DBMS] and nonprocedural languages."

That was the advice Robert Stewart gave to a group of black programmers who attended a workshop on future trends here at the recent fifth annual meeting of the Black Data Processing Association (BDPA).

Stewart, a manager of competitive analysis for Sperry Corp.'s Competitive Systems Division in Blue Bell, Pa., said blacks in DP, and particularly applications programmers, need to develop professional skills in areas that are likely to be at the forefront of future computer systems developments.

Communications Arena

"If I were you, I'd get involved in communications," he said, pointing out that communications within networks and through gateway technology to other computer systems will be required by businesses seeking to maintain profitability. "I'd go back to school and take some courses," he added.

Also speaking at the workshop was Antonio Parham, a black member of Hewlett-Packard Co.'s Systems Development Group, who explained his company's work in the field of integrated medical systems.

HP, according to Parham, is developing extensive networking structures to enable hospitals to "improve productivity in the delivery of services" as increasing demands for services strain limited financial resources.

Stewart, who is responsible for analyzing systems developed by Sperry's competitors, said, "All the vendors are putting their money" into the development of relational data bases.

Businesses, seeking to maximize productivity and profits, will seek common data bases for all functional departments within their organizations, according to Stewart. "Programmers are not just going to have to know bits and bytes, [they are] also going to have to understand how the company makes money from its products," he said.

As microcomputers proliferate in business organizations, Stewart said, programmers will have to become adept as data base managers. "[DBMS] are going to be the thing I think that we, as vendors, both software and hardware, are going to concentrate on the next few years."

CW at BDPA

Parham pointed out that hospital life-support functions previously hooked into minicomputer systems can now be located at bedside in microprocessor-based monitors. As such devices proliferate, he added, "We're going to have to have strategies in place to distribute the data over networks" to a limited staff.

Microcomputers will have easier-to-use applications languages with which to manipulate data, but they will still require DP personnel to manage data bases, according to Stewart. The task for DP personnel, he said, "will be how do we manage data — putting information into the hands of the end user."

Stewart noted that Sperry and other vendors all maintain data bases on their competitors and make them available on-line to sales personnel who need the information immediately.

"We've taken a long time to do some of these things, an awful long time. We're not going to be able to do that anymore," he said.

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To Develop Management Document

OMB Requests Public Comments on Info Policy

WASHINGTON, D.C. — The U.S. Office of Management and Budget (OMB) has requested public comments to help it revise current federal information management policies and develop a comprehensive policy document.

The OMB project, the agency said, was undertaken to "establish government-wide policies which enhance the appropriate application of information technology, encourage better management and allocation of technological resources and eliminate unnecessary structural or administrative barriers to more efficient information resources management."

The agency is reviewing existing policy circulars that cover such topics as DP administration and management, computer security, records maintenance, cost recovery and interagency sharing of DP facilities.

OMB also said it is considering broadening the range of its policy directives in its effort to develop a more comprehensive policy statement.

The agency is soliciting comments on a number of topics including: general principles of information resources management, privacy in information gathering and processing, competition with the private sector, DP security, standards, software management, long-range planning and microcomputer technology, end-user computing and office technology.

Comments on these and other topics related to the OMB policy project should be submitted by Nov. 14 to J. Timothy Sprehe, Office of Information and Regulatory Affairs, Room 3235, New Executive Office Bldg., Office of Management and Budget, Washington, D.C. 20503.

Users Group To Donate Licenses

COLLEGE PARK, Md. — The Mumps Users Group has announced a program to donate licenses for the use of Mumps computer languages in colleges and universities.

According to Dr. Ruth E. Dayhoff, chairwoman of the Mumps Users Group, the licenses, provided by six vendors of Mumps-based systems, will be awarded on the basis of proposals to use Mumps for educational and research purposes as well as on the qualifications of the applying institutions.

A grants panel created by the organization's executive committee will review the proposals.

"Our objectives are to set the stage for the next generation of Mumps users and to give the language a more assertive presence in the preprofessional student world," Dayhoff said. Each participating institution will be expected to produce reports suitable for publication describing the projects being undertaken, Dayhoff said.

The vendors in the program are: Data Tree, Inc.; Digital Equipment Corp.; Harris Corp.; Intersystems, Inc.; Micronetics, Inc.; and Vista Computer Co.

Institutions interested in participating in the Mumps licensing program should send their proposals and qualifications to Ruth Dayhoff, Chairwoman, Mumps Users Group, Suite 308, 4321 Hartwick Road, College Park, Md. 20740.

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Wiley Speaks on AT&T Breakup Via Audio Link

By Jim Bartimo
CW Staff

SAN DIEGO — Although detained by a late-breaking development in Washington, D.C., Richard Wiley — a former head of the Federal Communications Commission (FCC) and senior partner of a Washington law firm — still managed to address International Data Corp.'s 1983 Fall Executive Conference here last week in absentia.

Through an audio conference linkup, Wiley, who is with the firm of Wiley, Johnson & Rein, spoke about the Jan. 1 breakup of AT&T. His comments were in tune with the conference's theme, "Business Communications: Challenges for the 80s."

"I'm not saying AT&T likes the breakup," Wiley said, "but if they had to have divestiture, this one left them in a good position. The company is now in a position to be a major player in the communications game beyond the local loop."

In the unusual keynote address format, Wiley also expressed his feelings on the following divestiture issues:

- On the Bell operating companies — "The [Bell operating companies] have a difficult road ahead. We're going to see a lot of effort made to free them up from the regulation the divestiture has placed on them."
- On costs — "We're going to see some real negative reaction to the higher local costs, the complex billing structure and the lack of good services. Congress will blame the FCC for this."
- On state regulation of the Bell operating companies — "It's unfortunate to see states limiting bypass [of the operating companies' local loop]. While bypass will definitely hurt the [Bell operating companies], it is still the implementation of a new technology. The technologies are there, and the government has said it wants to see this type of competition."
- On other carriers such as MCI Communications Corp. and Sprint — "These companies will have a more limited access [to the long-distance telephone network] than AT&T," Wiley claimed. "If these companies are forced to raise their rates and AT&T's are lowered, the question will be 'Why go with the other carriers and dial all those extra digits?'

"There's a real problem here. We brought you all this [divestiture] to bring competition to the telecommunications industry. We don't want to go back to a monopoly."

Wiley also suggested that all the complexity of divestiture and the confusion that will inevitably follow might have best been avoided by never bringing AT&T to court.

"The lawyers and the consultants will benefit the most from this change," he said, adding that it is probably too late to turn back now.

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September 21, 1983

Exec: Users to Monitor AT&T After Breakup

By Jim Bartimo
CW Staff

SAN DIEGO — Because the Federal Communications Commission (FCC) will not regulate AT&T and the U.S. Congress will probably not legislate heavily against the company after divestiture, the responsibility of monitoring AT&T will be left to the users, according to Alan Pearce, president of Information Age Economics, Inc. and editor of the "Telecom Insider" newsletter.

"The onus of making the change from monopoly to competition lies with us, the users," Pearce said, "and I pray to God we're up to it."

Taking a relatively dim view of the coming divestiture, Pearce made his comments at International Data Corp.'s 1983 Fall Executive Conference held here last week.

Reason for Concern

One reason for his concern about divestiture is the FCC's departure from the regulation business. Due to the laissez-faire attitude of the Reagan administration, the FCC will not be looking out for users' needs, Pearce said.

"In Washington, [D.C.], the referees and the umpires [at the FCC] are going into retirement. Imagine what Sunday's games would have been like without referees and umpires," he explained, using the sports world as an example.

Calling AT&T after divestiture a "down-sized monster," Pearce said the monster would come to market angry and take its anger out on users. This will lead to two trends: Short-haul costs will increase, and long-haul costs will increase, he said.

A more positive trend will be the changing of the long-distance network from mostly analog to mostly digital. "This is a decision that was made early on in the data processing market," Pearce said. The same decision could have come earlier if AT&T had not had such a large installed analog base.

Another trend for users to watch is the bundling of services by AT&T. Although bundling will make it easier for users, the end-to-end service will cost significantly more. "Bundled services will play on your ignorance," Pearce said, "AT&T is going to charge you if you confess your ignorance."

Pearce said that Americans have a fascination for competition that led to the AT&T breakup. "Competition is not all it's cracked up to be. Competition can be nasty . . . and confusing for telecommunications managers," he said.

Booklet Aims At Security For Micros

MADISON, Wis. — Assets Protection Publishing has made available "Microcomputers: A Checklist of Security and Recovery Considerations," which provides a set of questions designed to assist users in establishing a comprehensive protection program for micros.

The publication covers security, application backup, documentation, maintenance and contingency planning and addresses security and recovery considerations for large companies with increasing numbers of microcomputers.

Copies of the publication are available for $1 each from Assets Protection Publishing through P.O. Box 5323, Madison, Wis. 53705.

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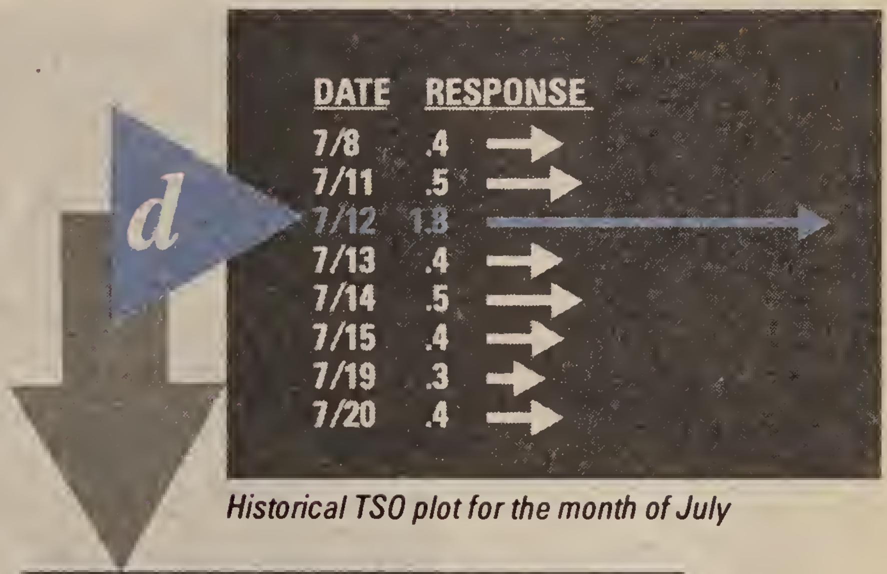
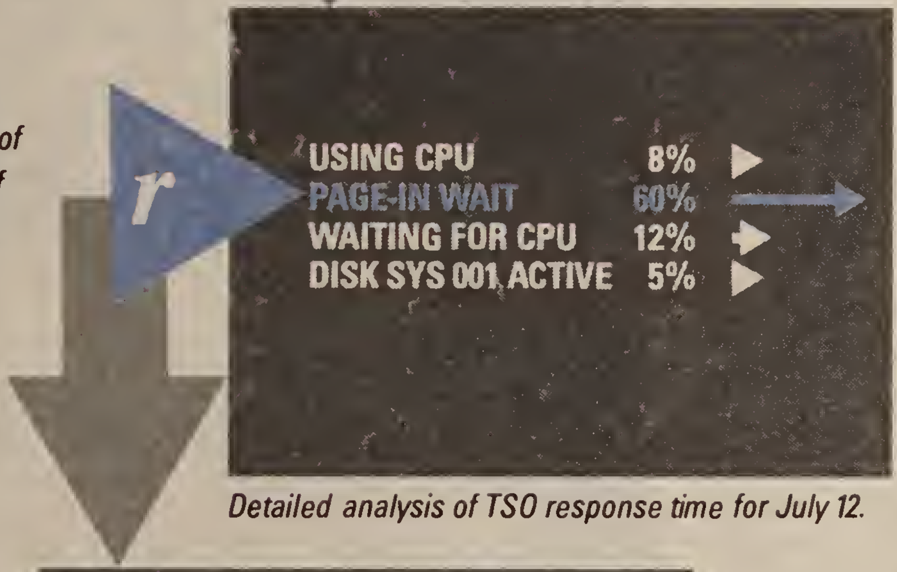


```
DATE  RESPONSE
7/8    .4  →
7/11   .5  →
7/12  1.8  →
7/13   .4  →
7/14   .5  →
7/15   .4  →
7/19   .3  →
7/20   .4  →
```

Historical TSO plot for the month of July

Step 2

The result is a display of degradation reasons for that time period. Now you know the major causes of poor response. In this case, paging caused 60% of response time problems. But what is causing the degradation? Place an "r" on the problem line and press enter.

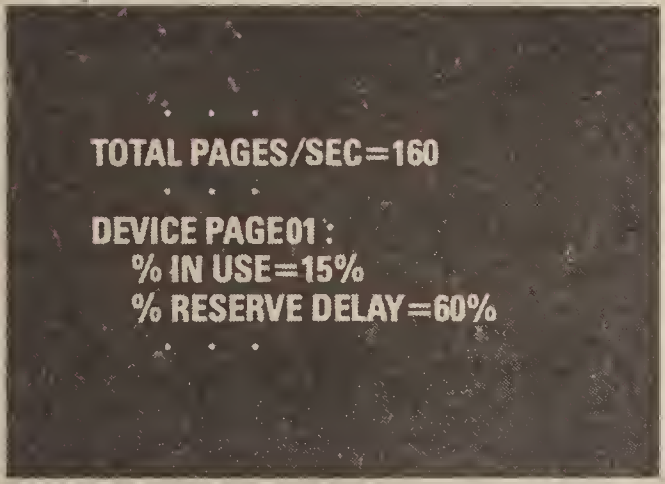


```
USING CPU                8%  ▶
PAGE-IN WAIT            60%  →
WAITING FOR CPU         12%  ▶
DISK SYS 001 ACTIVE      5%  ▶
```

Detailed analysis of TSO response time for July 12.

Step 3

EPILOG/MVS will automatically bring you the information needed to help analyze degradation for that time of day. In this example, Step 3 shows an analysis of paging activity where a paging device has contention from another system.



```
   . . .
TOTAL PAGES/SEC=160
   . . .
DEVICE PAGE01:
   % IN USE=15%
   % RESERVE DELAY=60%
   . . .
```

Analysis for paging on July 12

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A-197

International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

FRANCE

PARIS — France's two leading electronics companies, Compagnie Generale d'Electricite (CGE) and Thomson-Brandt, announced they will pool their resources in order to avoid competition, curb losses, increase imports and help keep France out in front with high technology. This move marks the first major restructuring in the electronics industry since it became nationalized after the election of Francois Mitterand. After an exchange of company assets, CGE will become France's premiere telecommunications manufacturer, and Thomson will concentrate on consumer and military electronic components.

- - - - -

PARIS — Thomson-Brandt unveiled a fully digital private switching system called the Opus 4000 here during Sicob. Based on the Motorola, Inc. 68000 microprocessor, the voice and data system reportedly features multifunction business terminals (called Communicators) and a digital switch that reportedly enables regular telephone wire to handle voice, data, text and images. The Communicator is an integrated multiservice communications system with a capacity of up to 4,000 lines and can reportedly integrate heterogeneous networks such as telephone, data processing, office automation and telex networks.

Thomson contended that the business communications market is growing at over 18% a year and is aiming its product at U.S. OEM contracts. Thomson added that 40% of its $2 million in annual sales comes from export markets.

- - - - -

PARIS — Norsk Data A.S., the Norwegian vendor of the 32-bit ND-500 family of superminicomputers, unveiled a new high-end model here at Sicob. The Model ND-570/CXA boasts capabilities of 3.4 million instructions per second, according to the vendor. The basic ND-570/CXA system configuration, priced at $300,000, consists of one ND-500 CPU, one ND-100 CPU, a multiuser operating system, a floppy disk, a system console and 2.25M bytes of main memory. The system is also said to run on the Unix operating system.

JAPAN

TOKYO — Apple Computer Japan, Inc. will market its Lisa microcomputer product family in Japan in October. Nasaya Fukushima, president of Apple's Japanese subsidiary, said Lisa will appeal to the Japanese office environment, especially after Kanji character processing capabilities are added.

- - - - -

TOKYO — Digital Equipment Corp. Japan has developed a Japanese version of the VAX/VMS operating system software for the company's VAX-11 family of 32-bit superminicomputers. At the same time, DEC Japan has unveiled Japanese word processing software, Japanese electronic mail and a Japanese editor.

- - - - -

OSAKA — Sharp. Corp. has introduced a line of television receivers equipped with 8-bit integrated microprocessors. Called Micomputer TVC1, the product line includes a 14-in. screen model ($423) and a 19-in. screen version ($660). With the aid of a basic five-function key box, the user can perform graphics, message exchange and tap educational and game applications as well, the vendor claimed.

- - - - -

TOKYO — Toshiba Corp. has unveiled a thermal color printer designed to operate with TN-5400 personal computers. The product reportedly features seven colors at speeds of one page/min. Pricing on the TN-5400 starts at $4,000, Toshiba said.

MEXICO

MEXICO CITY — To assist in the development of a more nationalized computer industry, representatives from several private comput-

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International Report

FROM THE CW INTERNATIONAL NEWS NETWORK

er companies here demanded that Mexican government contracts for DP equipment be limited to those offered by Mexican firms. "Adequate legislation should be promoted to force the federal government to publish their requirements for acquisitions of computer goods and services far enough in advance so that Mexican firms might be able to complete them in time," Ing. Sergio Ferragut of Cullinet International stated.

- - - - -

PUEBLA — A data base of metal workers and engineers has been established here by the Bureau of Subcontracting, an agency that represents about 250 Mexican contracting firms. A spokesman stated that the bureau will manage information on its members and try to match them with the needs of subcontractors in Mexico.

SWEDEN

STOCKHOLM — "Never before has there been so much interest in a programming language as there has been in Ada," claimed Lennar Manson, a research engineer at Sweden's military research center. Ada is going to be used in battle-control equipment ordered by the Swedish Air Force, according to the State Defense Materials Authority. According to Manson, who is one of the founders of the Ada Society in Sweden, the Swedish State Telephone Co., Ericsson Information Systems and Swedish Philips are all in the process of starting Ada projects. Industry sources claim the Institute of Technology at Lund University is itching to start teaching Ada.

- - - - -

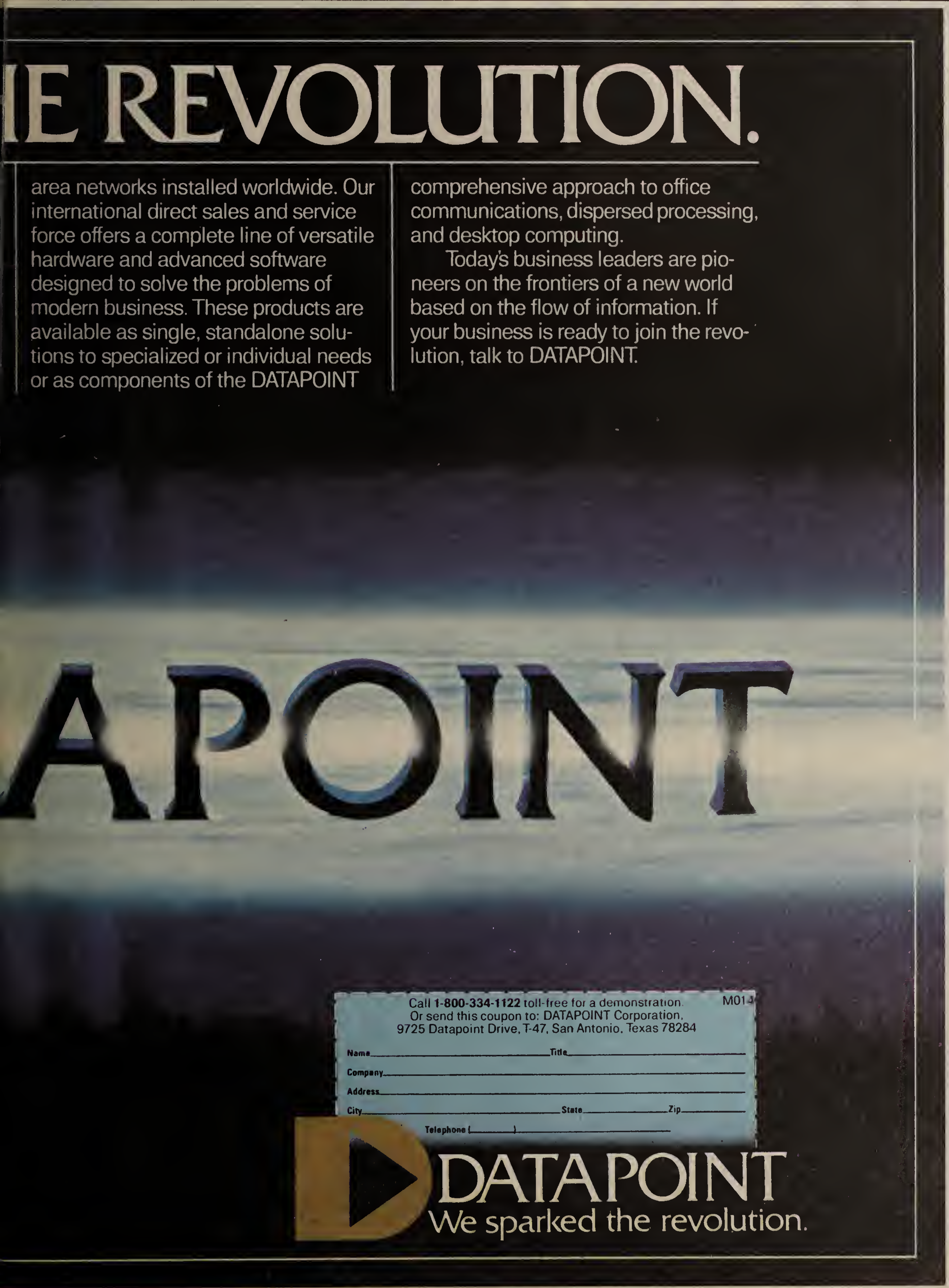
STOCKHOLM — The Swedish Data Vulnerability Board recently announced a training program designed to identify data security risks and improve data security in both Swedish commercial enterprises and government agencies. "It is impossible to determine the extent of data spying in Sweden; the victims are as silent in Sweden as in other countries. "Nobody wants to say how bad he is at security work," a spokesman said. The new program, SBA-Metoden, consists of written and audiovisual material that reportedly enables managers to evaluate and identify quickly their security risks and requirements. The program costs approximately $160 and is available from the Swedish Vulnerability Board at Datainspektionen, Box 12050, 102 22 Stockholm, Sweden.

- - - - -

STOCKHOLM — "We must put an end to private copying" was the battle cry sounded by big Swedish software houses and the Swedish organization for suppliers of computer and office equipment, LKD, during a recent software forum here. Iwan Bratt of LKD estimated that roughly $10 million worth of revenues are lost each year due to illegal copying. "The serious problem is not so much 'buddy copying' of games between youngsters, but theft of expensive professional programs," Bratt maintained. To help combat private copying, LKD has established a special legal department and is closely cooperating with Sweden's major software companies in order to track their anticopying efforts. Swedish legislation has not kept up with the technical developments very well, Bratt said, and few, if any, cases of illegal copying have been brought to court.

WEST GERMANY

RUESSELSHEIM — A radical group calling itself "Rote Zellen" used explosives last week to blow up of one of Germany's major machine factories, Maschinenfabrik Augsburg-Nuernberg AG (MAN), leveling the data center of the manufacturer. Damage is estimated at $7.4 million. The group claimed responsibility for the act in a letter stating that MAN was building transport vehicles designed for Pershing II rockets, due to arrive in the federal Republic of West Germany this fall.



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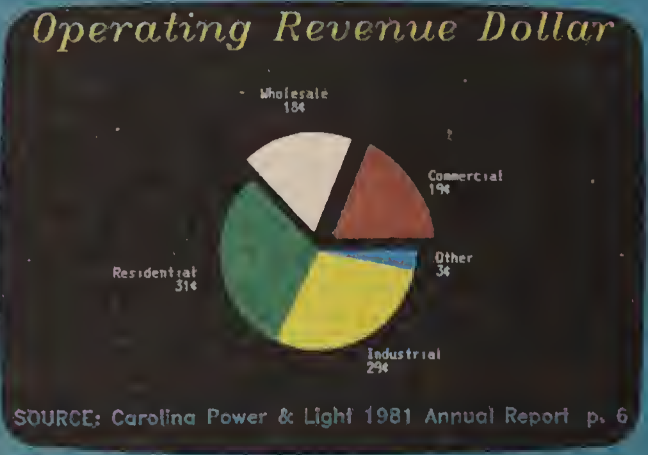
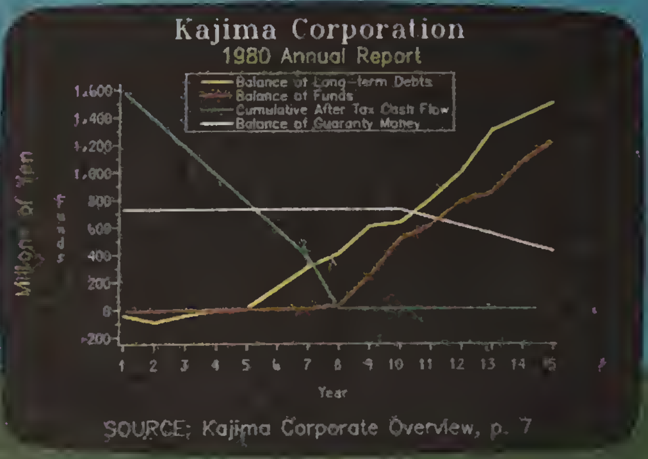
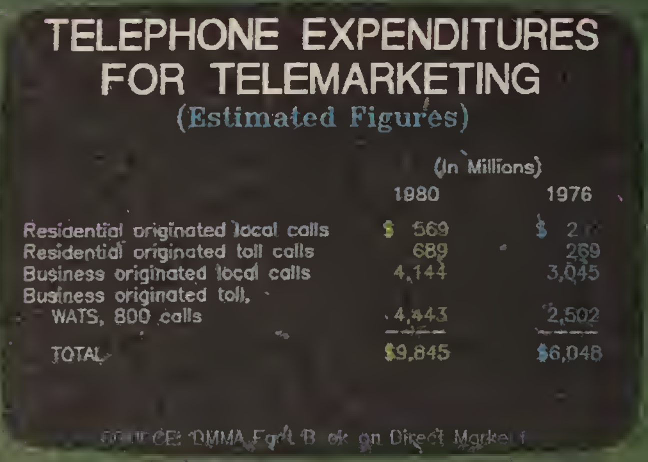


Pie Chart of Revenue



Plot of Funds*Year

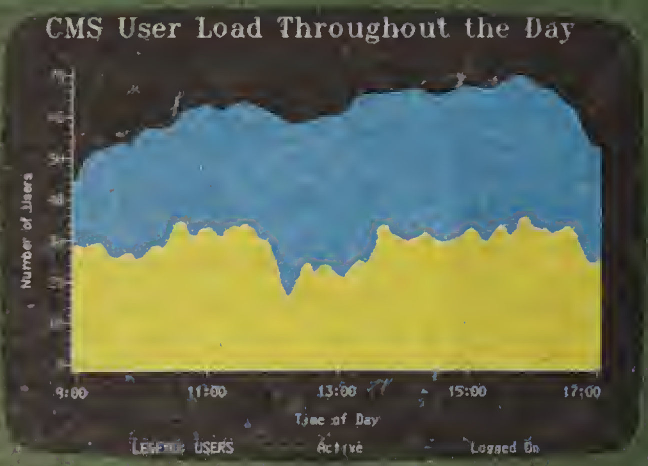


TELEPHONE EXPENDITURES FOR TELEMARKETING
(Estimated Figures)

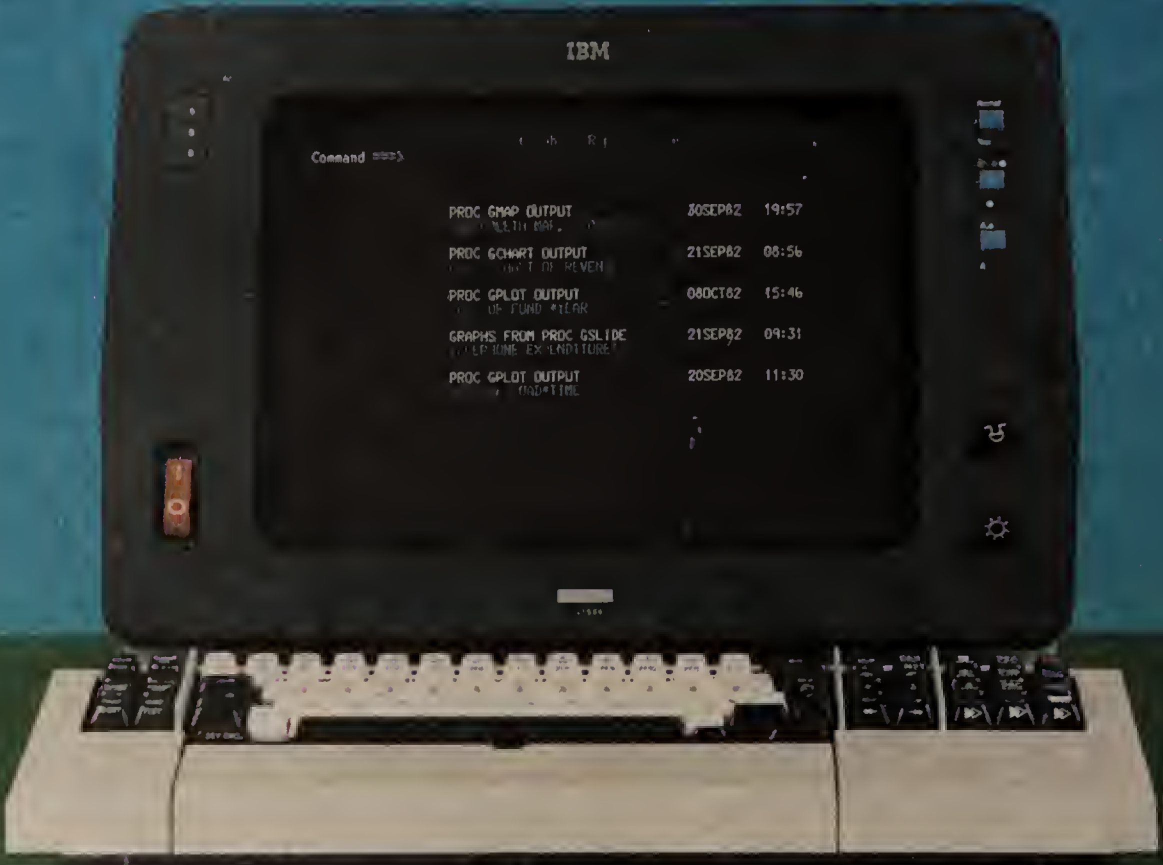
(In Millions)	1980	1976
Residential originated local calls	$ 569	$ 2[illegible]
Residential originated toll calls	689	269
Business originated local calls	4,144	3,045
Business originated toll, WATS, 800 calls	4,443	2,502
TOTAL	$9,845	$6,048

SOURCE: DMMA Fact Book on Direct Marketing

Telephone Expenditures



Plot of Load*Time



```
Command ===>

           PROC GMAP OUTPUT              30SEP82   19:57
           PROC GCHART OUTPUT            21SEP82   08:56
           PROC GPLOT OUTPUT             08OCT82   15:46
           GRAPHS FROM PROC GSLIDE       21SEP82   09:31
           PROC GPLOT OUTPUT             20SEP82   11:30
```

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- 20 Finance/Insurance/Real Estate
- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government—State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User ________

Vendors

- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor ________

2. OCCUPATION/FUNCTION (Circle One)

- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Services
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other ________

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Types of equipment with which you are personally involved either as user, vendor or consultant

- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems

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Australia's Tax Break Plan Gets Warm Reception

International Report

By Alan Power
Australasian CW

CROWS NEST, Australia — The Australian federal government's high-technology investment incentive tax scheme, which was approved by cabinet Sept. 16, has been warmly received by both the computer industry and the finance sector, although there is some concern that the scope of the scheme may be too broad.

The concern is that areas such as agriculture, fishing, forestry, architectural surveying and engineering consultant services, which are included in the scheme, may not be relevant to high-technology development and may erode the venture capital opportunities open to other specific industries.

However, the Minister for Science and Technology, Barry Jones, defended the plan by saying the government had followed the proposal committee's recommendations to the letter, and these areas had been included in the recommendations.

Under the plan, the government will forego about $18 million in tax revenue by giving investors in high-technology industries a 100% tax deduction on their investments. According to Jones, the total funds available for investment in the current fiscal year will amount to $39 million if all investment comes from the corporate sector.

Investments in high-technology companies will be from licensed management and investment companies which will be administered by a management and investment company licensing board.

Companies eligible for venture capital under the scheme will operate in the following fields: manufacturing, agriculture, fishing, forestry, postal, telephone, telegraph or teleprinter communications production, architectural surveying, consultant engineering, education/training and scientific services, computer software, data processing services and biotechnology.

"The point is that in terms of the 24 nations in the OECD [Organization for Economic Cooperation and Development], we rank 23rd in high-technology production. Time is running out for us; we have got to move very quickly," Jones declared.

The general opinion of the finance sector was that the scheme was a positive step forward not only in fostering the development of high technology in Australia, but also in creating an indigenous venture capital market.

Harold Tilley, the general manager of Business Loans and Equity Capital Ltd., a joint venture between Westpac Banking Corp. and UK banking interests, said that while there were reservations about the breadth of the scheme, it is a positive encouragement to Australian high-technology development.

Power is the managing director of Australasian Computerworld.

Bank School Set for Oct. 8

WASHINGTON, D.C. — The American Bankers Association (ABA) has announced that space is still available for the 1983 Trust Management School, Oct. 8-14, at Northwestern University in Evanston, Ill.

The week-long program will concentrate on general management concepts and specific trust management skills for banking executives. The 1983 program theme is strategic planning.

The cost is $1,950, which includes tuition, room, meals, program materials and school-related activities. Information is available from Victoria L. Street, ABA, 1120 Connecticut Ave. N.W., Washington, D.C. 20036.

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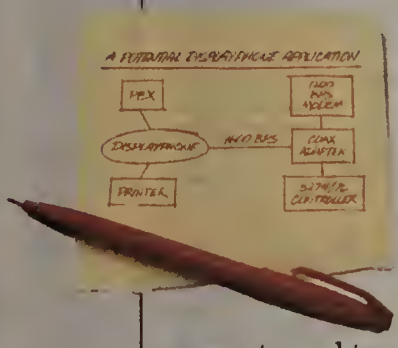

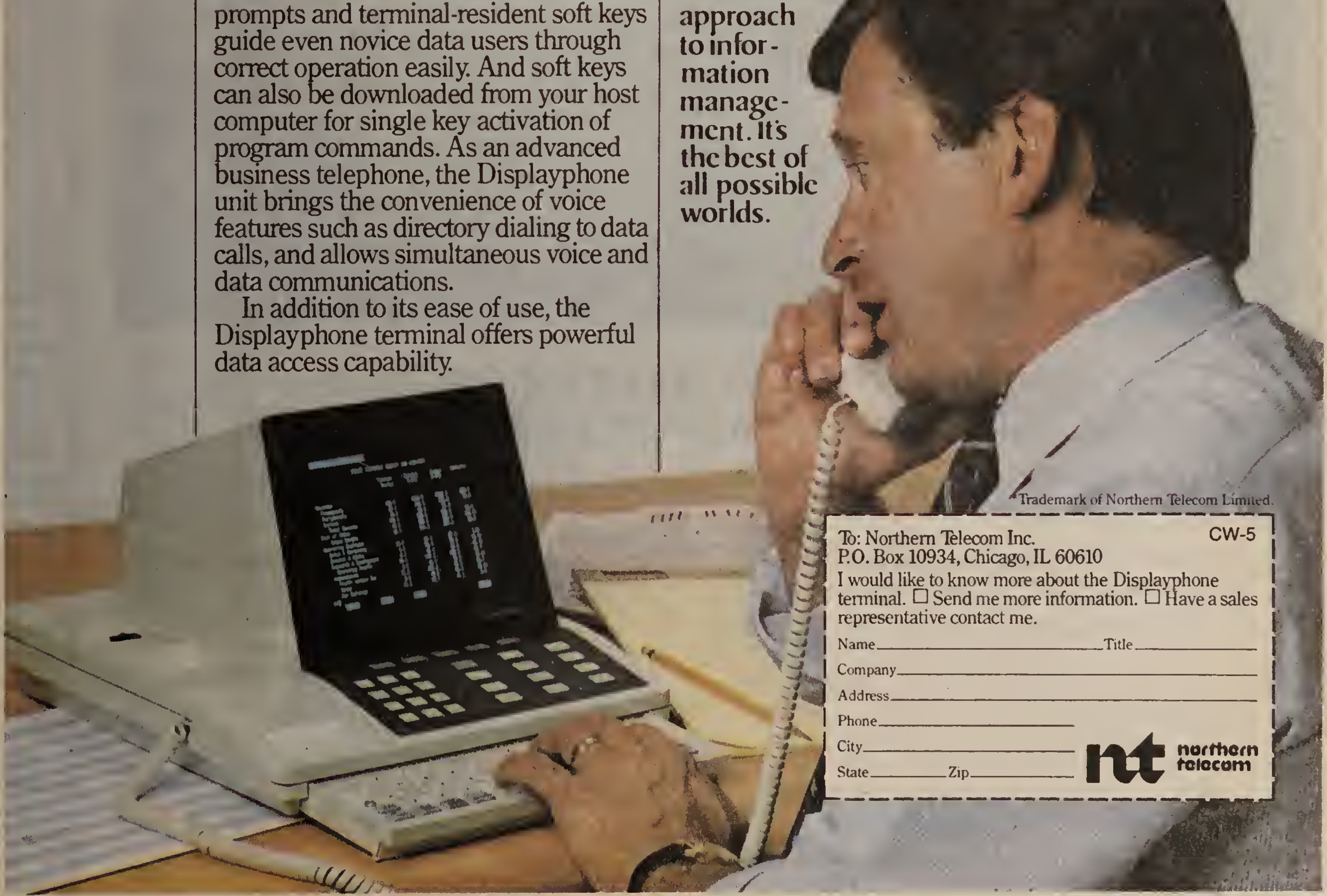

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Processor Glitch Interrupts Service to 18,500

By David Myers
CW New York Bureau

FREMONT, Calif. — A breakdown in a single electronic connector drove the Pacific Telephone Co.'s central processors insane earlier this month, leaving 18,500 phone users here without service for three-quarters of an hour.

John Vautier, control and analysis supervisor for Pacific Telephone, said the breakdown caused a plug-in circuit pack to "blitz" the entire phone system, wiping out "a certain percentage" of computer memory.

"It blitzed the central processors and wouldn't shut up. It kept putting out garbage. It made the central controller more or less insane," Vautier explained.

As a result, the computer's Western Electric 32K-byte ferrite-core memory device forgot phone numbers that had been changed or added to the system in the last 2½ weeks.

Phone company technicians had to erase the rest of the computer's temporary "call-store" memory and feed the phone numbers back into the system from floppy disks where the recent service changes had been recorded, Vautier said. The whole process took 15 hours.

The crisis started late in the afternoon on a hot day in this San Francisco Bay Area city.

Fremont's city hall, police department, libraries and emergency center all lost phone service.

Anyone trying to use his phone heard "a gong-like sound, like a cable slapping against a flagstaff, while in the background there was a sing-song of many numbers being dialed at once but no one answering," *The Oakland Tribune* quoted one phone user as saying.

Ken Dunham, spokesman for the phone company, originally blamed the outage on temperatures that hit 84 degrees that day. Later Dunham said the heat had been "discounted" as a possible cause for the computer's lapse in memory.

But Vautier told *Computerworld* that heat might in fact have caused the problem.

"It cannot be ruled out. We know circuit packs are sensitive to heat, and though the temperature that day was well within their operating limits, the cooler in the building was driving temperatures up and down all day. My feeling is that rapid changes may be more harmful than a rapid heat increase," Vautier said.

Whatever the reason for the failure, however, Pacific Telephone is taking steps to prevent its computer from forgetting any more phone numbers.

Vautier said the phone company is going to "a newer type processor" with on- and off-line disk files and memory residing in several locations.

The new processor is also manufactured by Western Electric, but the disk drives are made by Burroughs Corp., Vautier said.

"Divestiture gave us the chance to look at equipment from other manufacturers. Now all the [Bell] operating companies are looking for the best dollar value. We aren't necessarily locked into one manufacturer any more," Vautier said.

Video Packages From Deltak Eye Communications

NAPERVILLE, Ill. — Deltak, Inc. has made available two videotape conference journals containing edited highlights from speeches given by experts and policymakers in the communications industry at the fifth annual Communication Networks Conference held earlier this year in New Orleans.

The packages, produced by CW Communications, Inc. of Framingham, Mass., are said to provide industry information for executives and communications professionals who were unable to attend the conference. Each videotape in both series runs about 30 minutes and is said to be intended for busy executives and group presentations.

"Communication Networks: Alternatives for the '80s," Series 7CW-D99, features excerpts from speeches given by Federal Communications Commission Chairman Mark Fowler, former American Bell, Inc. President Archie McGill and Dr. Dixon Doll on topics such as short-haul microwave, private branch exchange technology, communications processors and satellite technology. The series is made up of five color video sessions.

In four video sessions, "Local-Area Networks: The Major Considerations," Series 7CW-E99, offers excerpts from the speeches of data communications pioneer Dr. John McQuillan, Diana Last, Dr. Kenneth Thurber and Dr. Howard Frank. The sessions focus on the capabilities and architecture of local-area network communications and the baseband vs. broadband debate, including how to choose the best systems for needs, flow control and diagnostic network monitoring.

The packages can be purchased or rented through Deltak's flexible Deltavision Library Plan. Purchase price is $150 per videotape or $600 for the series from Deltak, East/West Technological Center, 1751 W. Diehl Road, Naperville, Ill. 60566.

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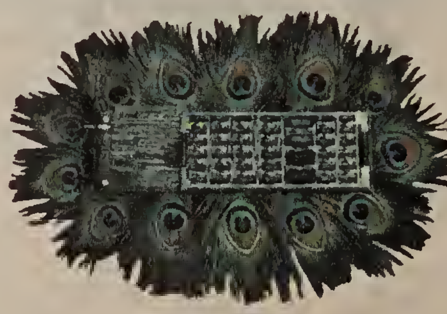

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In Providing Information for Lodging

Hotel System to Assist '84 World's Fair Attendees

NEW ORLEANS — If your heart is set on visiting the 1984 World's Fair and you discover that your favorite hotel is already booked solid, relax. You'll have plenty of help finding alternative lodging with the aid of a $400,000 computerized hotel referral system donated by Qantel Corp. of Hayward, Calif.

According to William Chernish, president of Qantel distributor Sunbelt Business Computers, Inc. based here, the computerized referral system was actually donated to the University of New Orleans' School of Hotel, Restaurant and Tourism Management, which has made the system available for use during the fair.

With the help of representatives from the Greater New Orleans Hotel-Motel Association, the Greater New Orleans Tourist and Convention Commission and the Louisiana Hotel-Motel Association, students from the school will operate the system, which was designed to give callers a wealth of information, including hotel availability for specific dates, a rating of each hotel and the hotel's address and telephone number.

Heart of the System

At the heart of the computerized referral system is Qantel's System 64 minicomputer equipped with a streaming tape drive, a 400M-byte disk drive and 10 Qantel VT 3 terminals. The System 64 will operate under the company's Hospitality and Leisure software package, which was designed for use in the hotel industry.

Chernish said the referral system will be tied to the fair's main information center using the company's Bestnet local-area network system. The system has been installed in a building adjacent to the fair site on the banks of the Mississippi River and is currently undergoing a 30-day shakedown run. Fair officials hope to have the system in use by November.

"It's a very simple system to use, but it's going to be very useful in assisting people who are trying to find accommodations for the fair," Jeffrey Stack, vice-president for marketing for the fair, said.

According to Stack, the Qantel system will only be used as a backup to the hotels' own reservations systems. If a particular hotel is booked, a caller will be given the number of the referral system, which will then direct the caller to alternative lodging.

Operators of the computerized referral system will not make reservations for callers and will not accept any money for hotel bookings. Organizers hope to avoid the problems that plagued the Knoxville, Tenn., World's Fair hotel reservations system — problems that led to millions of dollars in lawsuits from irate visitors.

"The Knoxville system resulted in massive lawsuits," Stack said. "They just simply overpromised. We are in the business of running a fair, not making hotel reservations. This system is designed simply to give visitors a source of information."

Organizers of the fair, which will revolve around the theme "Rivers of the World: Fresh Water as a Source of Life," expect approximately 11 million visitors to attend the event here, which will feature pavilions from 25 countries, eight major corporations and a number of states. Stack said that among the attractions will be pavilions highlighting space, transportation, flight and the world of high technology. The fair will run from May 12 through Nov. 11.

JCIT to Meet In Jerusalem May 21-25

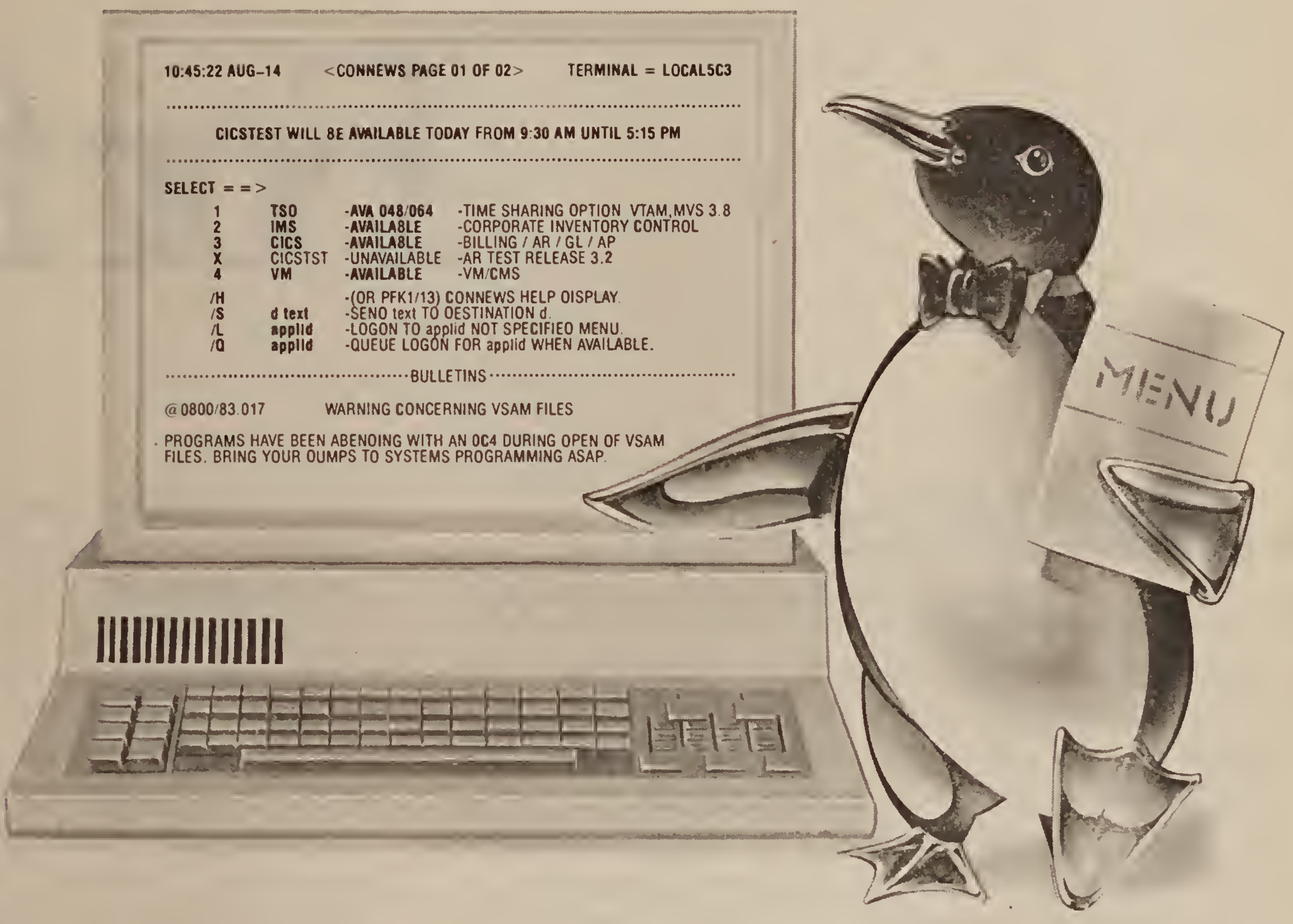
SILVER SPRING, Md. — The Fourth Jerusalem Conference on Information Technology (JCIT) will be held at the Jerusalem Hilton in Israel from May 21-25.

Sponsored by the Information Processing Association of Israel and the Institute of Electrical and Electronics Engineers, in cooperation with the Association for Computing Machinery, JCIT will cover a broad range of topics on computer technology and applications and explore the economics and management of the information industry, with an emphasis on software engineering and manufacturing.

The technical program will consist of papers by prominent invited speakers, submitted papers, panel discussion, workshops and exhibitions.

Registration fees prior to May 1 are as follows: participants are charged $200; senior executives are charged $200; students are charged $100; and accompanying persons are charged $100. After May 1, fees are: participant, $225; senior executive, $225; student, $115; accompanying person, $115.

Further information is available from JCIT-4 through P.O. Box 639, Silver Spring, Md. 20901.



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10:45:22 AUG-14      <CONNEWS PAGE 01 OF 02>      TERMINAL = LOCAL5C3
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       CICSTEST WILL 8E AVAILABLE TODAY FROM 9:30 AM UNTIL 5:15 PM
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      1      TSO       -AVA 048/064   -TIME SHARING OPTION  VTAM,MVS 3.8
      2      IMS       -AVAILA8LE     -CORPORATE INVENTORY CONTROL
      3      CICS      -AVAILA8LE     -BILLING / AR / GL / AP
      X      CICSTST   -UNAVAILABLE   -AR TEST RELEASE 3.2
      4      VM        -AVAILABLE     -VM/CMS
     /H                -(OR PFK1/13) CONNEWS HELP OISPLAY.
     /S      d text    -SENO text TO OESTINATION d.
     /L      applid    -LOGON TO applid NOT SPECIFIEO MENU.
     /Q      applid    -QUEUE LOGON FOR applid WHEN AVAILABLE.
.................................BULLETINS...................................
@0800/83.017         WARNING CONCERNING VSAM FILES
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Call for Papers

OFFICE EQUIPMENT EXPOSITION/OFFICE INFORMATION SYSTEMS CONFERENCE (Coee/OIS), Rose, Ill. June 19-21, 1984.

Papers are sought for presentation in the technical program at the eighth annual Coee/OIS. The OIS conference will augment Coee, a comprehensive exhibition encompassing computers, software and peripherals, office information systems, word processing systems, data and telecommunications, office furnishings and other related products.

Abstracts are solicited in the following or related subject areas: new developments and applications of software business operations, communications, networking, data base management, word processing and interconnection of computers, data base management and systems, distributed data processing, computer systems for small businesses, mainframes, minis, micros and portables, applications and development and graphics.

Abstracts are also needed for the following areas:

Communications/networking: voice, data, video (new development), local-area network, private branch exchange, integration and wideband networks.

Information systems management: designing, planning and implementing, effective information systems for business planning and operations.

Office automation: integrated office automation systems, effectiveness, benefits of office automation, management and administrative support systems, office automation applications and new developments.

Word/information processing centers: new developments, user application case histories and specific task implementation.

Authors are invited to submit 200- to 300-word abstracts of their proposed papers by Nov. 15. Papers will be selected and authors notified on or about Jan. 15. Abstracts should be submitted to Coee/OIS Program Coordinator, Cahners Exposition Group, Cahners Plaza, 1350 E., Tougy Ave., P.O. Box 5060, Des Plaines, Ill. 60018.

THE CUSTOM INTEGRATED CIRCUITS CONFERENCE, Rochester, N.Y., May 21-23, 1984.

Original papers are solicited in the following areas as they relate to custom devices and integrated circuits.

Computer-aided design: device and process modeling, circuit simulation, layout verification, testability and very large-scale integration design aids.

Gate arrays, semicustom and full-custom integrated circuits: trade-offs and design techniques, complementary metallic oxide semiconductors (MOS), N-Channel MOS, bipolar and gate arrays.

Custom analog integrated circuits: smart sensors, imaging arrays, signal processing and transform implementation.

Applications: industrial, automotive, consumer, communications and medical. Designed integrated circuit systems on chip.

Fabrication technologies: silicon and nonsilicon, mixed processes and direct wafer writing.

Interfaces and packaging: voltage/current translators, hybrids and interconnects.

Testing and reliability: design for testability measurement techniques.

Authors are asked to submit 50 copies of a 250-word summary and a 35-word abstract representing original, unpublished work suitable for a 20-minute presentation. Deadline for submission is Dec. 30. Papers received after December 30 will be considered late papers. The author's name, affiliation, complete address and telephone number must appear on the summary. Notice of acceptance will be mailed by Feb. 10. Authors of accepted papers will be required to submit a manuscript by March 16 of up to five pages, including figures, in camera-ready format for publication in the conference proceedings. Late papers received by March 1 will be considered for a 10-minute presentation.

Abstracts and other correspondence should be addressed to Dr. Wesley N. Grant, Technical Program Chairman, Sperry Computer Systems, Sperry Park, P.O. Box 43525 MS Y11B1, St. Paul, Minn. 55164.

FIRST ANNUAL ASSOCIATION FOR COMPUTING MACHINERY (ACM) NORTHEAST REGIONAL CONFERENCE: INTEGRATING THE INFORMATION WORK PLACE — THE KEY TO PRODUCTIVITY, Lowell, Mass., March 19-21, 1984.

The conference will concentrate on topics with near-term applicability to both the business and industrial computer environments. Particular emphasis will be placed on how the professional can use the many tools currently available to create a more productive environment.

Papers are sought for the following topics: integrated manufacturing (computer-aided design and manufacturing), artificial intelligence, power personal/professional workstations, office automation, decision support systems, distributed and centralized data base management systems and local and wide-area networks.

Additional information on submitting papers may be obtained from Lloyd Howells, Program Chairman, ACM Northeast Regional Conference, P.O. Box 499, Sharon, Mass. 02067.

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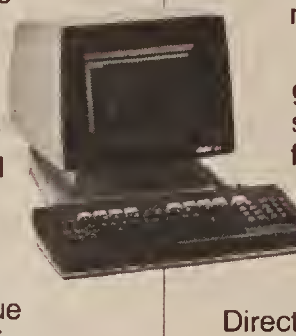

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DPMA's Palmer Named Director At NCGA

FAIRFAX, Va. — Edward J. Palmer, executive director of the Data Processing Management Association (DPMA) of Park Ridge, Ill., has been named executive director of the National Computer Graphics Association (NCGA).

Palmer, who will take over the position in October, will be responsible for managing overall planning and programming and will serve as liaison between NCGA's staff and the board of directors and executive committee.

Palmer joined DPMA in 1976. He holds a degree in business administration from Boston University and a certificate in data processing from the Institute for the Certification of Computer Professionals.

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Critical to Successful Data Control

Management of I/O Bottleneck Key, Exec Warns

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — Managing the I/O bottleneck will be the key to the successful management of data within an organization, the recent IBM Futures Conference here was told.

Gene DeKoster, vice-president of planning and requirements at Storage Technology Corp., said there will be new architectures and more ways of performing I/O functions in the next five years than there have been in the previous quarter century.

"Connectivity to the information base will be critical and will result in control passing away from the data processing center to the users. We have to understand what is happening in the market and to applications to assess correctly our response," he told his audience of DP managers and professionals.

Demanding Answers Now

Users are demanding answers now, he added, and are not willing to wait for the DP department to catch up with its backlog.

"The whole system is under stress. There are 25 million office terminals alone waiting to come onto mainframes. This is going to cause a huge data connectivity problem, and migration is essential both within the DP shop and without," he said.

To be successful in this arena, the former IBM technician continued, companies will need to be vertically integrated. They will have to manage multiple technologies within a system environment.

This will require effective application of innovative technologies, he stressed, including optimized CPU resources, automated handling techniques and increased performance/capacity ratios.

New storage systems must be developed, he added, and new maintenance methodologies defined to include remote maintenance — designing the actual maintenance facility within the storage device.

But DeKoster warned against so-called panaceas. A single device or technology cannot solve the variety of storage systems requirements, he contended, because of the wide spectrum of such requirements.

CW at IBM Futures

"Knowing what data is on what technology at what time and for what purpose and being able to manage those questions is going to be the problem of the future in the storage arena," he said.

DeKoster cautioned against being "carried away" with the potential of device technology, such as thin-film-head technology. Performance, he noted, has not kept pace with increases in capacity. It is the data path, he asserted, where the problems lie and which needs to be fixed, not the devices.

As a result, he continued, innovative new packaging techniques are vital. "Data path is the key, and data management is the solution," he said.

DeKoster also warned against an industry trend toward erasable data. It is a moot issue, he insisted, because the value of data through time can often be enormous. "Information is not changeable. In fact, users do not want to change data; they want to refer to it, and the cost of storing data is the only consideration to be dealt with," he concluded.

Venator Named To Replace DPMA Director

PARK RIDGE, Ill. — The Data Processing Management Association (DPMA) has announced that John A. Venator, deputy executive director of DPMA, has been named acting executive director following the resignation of DPMA Executive Director Edward J. Palmer.

Venator, who has served DPMA since 1977, became deputy executive director in 1981, adding the duties of that position to his responsibilities as director of marketing and membership programs and services, a DPMA spokesman said.

Edward Palmer, who was DPMA executive director since 1976, is leaving the association to take a similar position in the Virginia area. Palmer has been a member of DPMA since 1961. He had served 24 years in all areas of information processing, operations and administration prior to serving as DPMA executive director from 1976 to 1983, according to the spokesman for DPMA.

Venator will direct a headquarters staff that supports the membership and educational programs of DPMA, which has 32,000 members who are computer management executives in industry, business, education and finance as well as a computer student population of 11,000.

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AI Applied to OA Eases Human Interface: Exec

By Cheryl M. Gelb
CW Staff

PARIS — Making a strong commitment to human-oriented design principles, Japan's Toshiba Corp. has found that "the application of artificial intelligence techniques to office automation systems is currently feasible and improves the human interface."

So said Kenichi Mori, manager of Toshiba's Information Systems Laboratories, at the Ninth World Computer Congress held here recently by the International Federation for Information Processing (Ifip).

In the past, Mori told a large audience eager for news of Japanese advances in OA, engineers have endorsed a machine-oriented design principle with the objective of enhancing machine efficiency.

But, Mori asked, "can engineers continue to design new machines using old machine-oriented techniques?" The answer is clearly "no" if automated office systems are "to be of simple use and as helpful as possible for all levels of office workers, from executive managers and professionals to clerical and secretarial staff."

The solution thus lies in a commitment to a human-oriented design principle which has as its objective the enhancement of human efficiency, Mori said. The result of this approach is a product whose size and shape is fit for human environments. Commands to the machine are made in "human communication media," including "voice characters and graphics," according to Mori. Moreover, the machine can be used by an unskilled operator.

"The ideal machine," Mori added, "should allow the worker in an office to communicate with the machine in natural forms of human communication."

With this creation of office systems that ease the human interface, Toshiba has also developed four systems by applying AI techniques. The four systems include a word processor capable of converting Kana (Japanese) to Kanji (Chinese), a voice activated word processor, an optical character recognition (OCR) system that reads hand-printed Japanese characters and a line-drawing interpretation system that converts hand-drawn graphics into printed output.

Using AI Advances

Toshiba was able to develop these systems, Mori pointed out, "because the field of artificial intelligence is providing advanced techniques. The primary feature of this advance is the use of knowledge-based assistance to recognize and understand" the forms of human communication that are "natural" or relatively unsophisticated.

Before discussing the development of Japanese word processors, Mori reminded his audience that the Japanese language consists of both Kanji and Kana characters. Typically, more than 3,000 Kanji and 50 Kana characters are used in everyday business communications. "The abundance of Kanji characters," Mori said, "has impeded the introduction of office automation systems" in Japan.

While Kana can be used exclusively, the resulting document is often awkwardly worded. Toshiba developed both a Kana-to-Kanji translation technique and a true Japanese word processor that contains a 30,000-word dictionary and permits input at 50 to 120 char./min.

"Now, for the first time in Japan, typing is faster than handwriting," Mori quipped.

To extend OA systems to managers and others unfamiliar with key operators, Toshiba next developed a voice-activated word processor. The user speaks slowly into the machine which "comprehends" the syllables and then converts the speech into Kana. A microprocessor containing the knowledge base then translates the Kana into Kanji.

'Not So Fast'

This input speed of the voice-activated word processor is 100 syllables per minute — "not so fast," Mori admitted — however, with the application of the knowledge base, it recognized 30,000 words and is 99.8% accurate.

Toshiba has also developed an OCR system that recognizes hand-printed characters. This accomplishment is notable, Mori said, because the structure of Japanese characters — of which 3,000 are in common use — is very complex, and many characters clearly resemble other characters.

Toshiba's OCR machine reads 50 hand-printed char./sec and is generally 95% accurate; however, with the application of the knowledge base, the machine is 99.6% accurate, Mori reported.

The fourth AI-based OA system developed by Toshiba is the handwritten, line-drawing interpretation system. This converts hand-written graphics, such as charts, into machine output. The user can predefine 200 symbols, Mori noted.

"These examples represent the leading edge of technology in the direction of friendly interface man-machine systems," Mori concluded, adding, however, that much work remains to be done in natural language processing, continuous speech understanding and knowledge-based systems.

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Merger of Needs Cited as Key to Data Base Use

By Paul Gillin
CW Staff

PARIS — Important barriers need to be broken down before artificial intelligence and other high-powered applications of data bases can be made practical. That was the consensus of two data base experts who discussed "Data Models and Knowledge Representation" at the recent International Federation of Information Processing (Ifip '83) Conference held here.

"It's become quite apparent that if we are going to reduce the cost of using computers we have to make it easier for people to design and use data bases," asserted Antonio Furtado, a professor at Pontifica Universidade Catolica in Rio De Janeiro. But to do that we first have to come to some sort of agreement between the different interests of those who use the data base, he said.

Furtado said that efforts to standardize data base architectures have typically centered on very different needs. "Those that emphasized efficiency [such as network and hierarchical models] were based on navigation," Furtado added. "However, these models have been criticized on semantic grounds. People felt that those data models are too close to physical files and not close enough to reality."

Efforts to fill the gap between physical files and reality have evolved into a two-stage process, he said. The data model is typically close to the physical files, but ways to create an "information model" that is helpful to the user have stirred controversy.

Some solutions such as order logic and abstract data types have been criticized for straying too far away from artificial intelligence applications, while interfaces like semantic networks and frames and scripts are considered too close to artificial intelligence.

"There is some pressure toward creating better data models," Furtado said. These include nonconventional techniques like text, speech and image interfaces as well as time dimension stored facts and inferential data bases, active systems, decision-support-like systems with data base components and expert systems.

Furtado would not recommend which method was best but said the fundamental question was how to satisfy the three major interest groups that are involved.

Designers, Implementors, Users

On the other hand, designers want to see semantic complexities and are concerned with what he called "expressive power." Implementors are concerned with machine complexities and generally want to improve efficiency. Users, however, do not want any complexity. Their first priority is simplicity, he said.

"Each of these guys should see the data base as they want to see it," he said. Until these conflicts are resolved, "it may be too soon to have very large data bases with knowledge-based techniques," he said.

Without offering a specific solution, Furtado recommended that simplicity is the criterion to attack first. The data dictionary is a good abbreviated frame of reference from which users could work. "Since this is much smaller, it is perhaps the place to start to help users use the data base more efficiently," he recommended.

Programming in its current form is totally unsuited to knowledge-based systems concepts, stated Carl Hewitt, a professor at MIT. Hewitt argued that data base management systems (DBMS) will actually play a very small role in the future of knowledge-based systems because their logical programming structure is inherently unsuited to the task. DBMS designers have focused too much on how systems are currently implemented rather than on how they should be implemented, he said.

Logic's Limitations

Praising Socratic Logic as "a marvelous achievement," he nevertheless stated that it has implicit limitations in programming. Those who are working toward knowledge-based systems should first try to understand those constraints, he said. "All state-of-the-art data base designers should take a compulsory course in logic and realize a lot of the things they're missing," he said.

Logic was defined to describe things, whereas knowledge systems are intended to "take action," Hewitt said. Logic is inherently inconsistent while logic programming strives for consistency.

To be effective, knowledge-based systems need to tolerate that inconsistency, he said.

"In most current DBMS, if you can't say something is not true then you can't say anything about it at all," he said. "As a result, standard semantics are not good for empirical knowledge."

The move toward open, distributed systems requires a structure that accommodates inconsistencies between the systems, which logic programming does not, Hewitt said. "Logic implementation and quantification are not suitable for this open, knowledgeable environment," he said. "We need a whole new logic structure to optimize the uses of logic in data management."

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Oct. 24, Washington, D.C. — **Telephone Bypass Technologies and Economics.** Contact: Frances A. Gatz, Telestrategies, Suite 102, 6842 Elmm St., McLean, Va. 22101.

Oct. 24-26, Amsterdam — **The Second Annual Comdex/Europe.** Contact: The Interface Group, Inc., 300 First Ave., Needham, Mass. 02194.

Oct. 24-26, Boston — **Local-Area Networks: Equipment and Systems.** Contact: Architecture Technology Corp., P.O. Box 24344, Minneapolis, Minn. 55424. Also being held Oct. 27-28 in Orlando, Fla.

Oct. 24-28, Orlando, Fla. — **Structured Analysis and System Specification Workshop.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 24-28, Chicago — **Auditing in the Contemporary Computer Environment.** Contact: Marge Umlor, EDP Auditors Foundation, 373 S. Schmale Road, Carol Stream, Ill. 60187.

Oct. 24-28, Cleveland — **Structured Systems Development.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 24-28, New York — **Structured Analysis for Microprocessors.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 24-28, Cleveland — **CICS/VS Command-Level Coding.** Contact: Yourdon, Inc., 1133 Ave. of the Americas, New York, N.Y. 10036.

Oct. 25, Los Angeles — **The Role of Facility Management.** Contact: Ms. Jinx Andrews, Facility Management Institute, 3971 S. Research Park Drive, Ann Arbor, Mich. 48104.

Oct. 25-26, Cary, N.C. — **Enhancing SAS Technical Support Skills.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 25-26, New York — **1984 Impact of Divestiture on Users and Vendors.** Contact: Marilyn Chasteen, The DMW Group, Inc., 2020 Hogback Road, Ann Arbor, Mich. 48104.

Oct. 25-26, New York — **IBM CICS/VS Systems Design Concepts.** Contact: Datapro Research Corp., 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 25-26, Washington, D.C. — **Telephone Bypass Strategies in Response to Access Charge Tariffs and Legislation.** Contact: Frances A. Gatz, Telestrategies, Suite 102, 6842 Elmm St., McLean, Va. 22101.

Oct. 25-27, Dallas — **The Second Qualtest Conference and Exposition.** Contact: James Bram, American Society for Quality Control, 230 W. Wells St., Milwaukee, Wis. 53203.

Oct. 25-27, New York — **Data Communication Concepts.** Contact: Suzzane Galliart, Memorex Customer Education, 3393 Octavius Drive, M/S 03-16, Santa Clara, Calif. 95051.

Oct. 25-27, Los Angeles — **SAS Processing Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 25-27, New York — **SAS Basics Course.** Contact: SAS Institute, Inc., P.O. Box 8000, Cary, N.C. 27511.

Oct. 25-28, Los Angeles — **Data Base Management Systems: Mini, Micro and Distributed Applications.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Oct. 25-28, San Diego — **Designing with 16-Bit Micros.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

Oct. 25-28, San Francisco — **The 19th Meeting of the Computer Performance Evaluation Users Group '83.** Contact: Institute of Computer Sciences and Technology, U.S. Department of Commerce, National Bureau of Standards, Washington, D.C. 20234.

Oct. 25-28, Boston — **Programming in C: A Hands-On Workshop.** Contact: Integrated Computer Systems, 3304 Pico Blvd., P.O. Box 5339, Santa Monica, Calif. 90405.

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Managers on the Move

HENRY E. MORELLI has been appointed to the position of vice-president, management information systems (MIS), for Datapoint Corp. in San Antonio, Texas. In this position, he will provide a centralized focus for Datapoint's internal management information systems. He will be responsible for reorganizing all the decentralized MIS activities within the company, setting new direction for systems development and integrating that plan with operational information systems.

Prior to joining Datapoint, Morelli spent eight years with Racal-Milgo, Inc. in Miami, where he was director of the MIS group. Prior to that, he held various information systems management positions with IBM and Informatics, Inc.

A graduate of Pace University with BBA and MBA degrees, he has also completed additional courses in information management.

• • •

BILL ELWOOD has been appointed to the position of vice-president of information systems at T.G. & Y, located in Oklahoma City. In his new position, he will be responsible for the information systems division. Elwood has the additional responsibilities of researching new technological advancements, developing strategic plans and interfacing with the systems steering committee, made up of T.G. & Y senior management.

Before joining T.G. & Y., Elwood worked for Target Stores as director of management information systems for eight years and as a senior financial analyst for three years. He was also a consultant with Touche Ross and Co. for two years. He also served as exchange officer with the U.S. Navy.

Elwood earned a bachelor of science degree in business administration and an MBA from the University of Minnesota.

Bill Elwood

• • •

CASEY L. PERRIMAN has been promoted to vice-president in the Systems Planning & Architecture Department at Union Bank's Southern California Service Center.

She has been with the bank since 1979, and her most recent position was that of systems manager. Perriman holds a bachelor of arts degree in computer science from the State University of New York.

(Continued on Page 45)

Casey Perriman

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Managers on the Move

(Continued from Page 44)

MICHAEL L. LACH has joined Allergan Pharmaceuticals as director of management information systems in Irvine, Calif. In this capacity, Lach will be responsible for all data and word processing functions within the organization.

Before joining Allergan, he served in a variety of management positions at Carter Hawley Hale Stores, where he was director of systems development as well as manager of technical support and computer operations for all divisions.

Prior to Carter Hawley Hale, Lach was district manager, systems software, for Pacific Northwest Bell Telephone Co.

Lach has a B.A. degree from St. Mary College in Winona, Minn., and a master's degree from the U.S. International University in San Diego.

• • •

WAYNE F. SMITH has been named manager of information systems and resources for Towlift, located in Cleveland. In his new position, he will be responsible for computer equipment and operations, systems and programming, credit area and collections, office equipment procurement in all stores and special projects.

Prior to his promotion, he served at Huntington Bank (Union Commerce) as manager of systems research and planning. From 1978 to 1981, he was the assistant vice-president of information services for Euclid National Bank. From 1977 to 1978 he was a project manager for the Computer Services Co. Smith is a graduate of Baldwin-Wallace College.

SHIRLEY ANN STOUGH has joined Quantum Corp. as a communications manager. In her new position, she will be responsible for public relations, advertising, trade shows and promotions.

She comes to Quantum from the Strayton Corp., where she served as a California branch manager.

Prior to that, she was corporate communications manager for General Automation, Inc. in Anaheim, Calif. She also worked as regional sales manager for *Production Magazine* and in marketing communications for NCR Data Pathing Systems Divisions.

• • •

The Daily News has appointed BRIAN F. CRYNES to the post of director of management information systems in New York City.

Crynes, a computer systems expert with broad technical and management experience, will be responsible for the operations of computer and communication systems that are used at *The Daily News.*

Before joining *The Daily News,* he was a senior manager in the management advisory services department in the New York office of Price Waterhouse & Co.

He graduated from the University of Scranton in 1968 and obtained a master's in business administration and finance from the same school in 1972.

• • •

MICHAEL J. BILOTTI has been named senior vice-president, systems and technical services, for Zayre Corp. in Framingham, Mass.

In his new position, he will be responsible for computer systems development, the telecommunications network and technical systems support.

He graduated from the University of Syracuse with a B.S. in electrical engineering; he has also done post-graduate work at Northeastern University.

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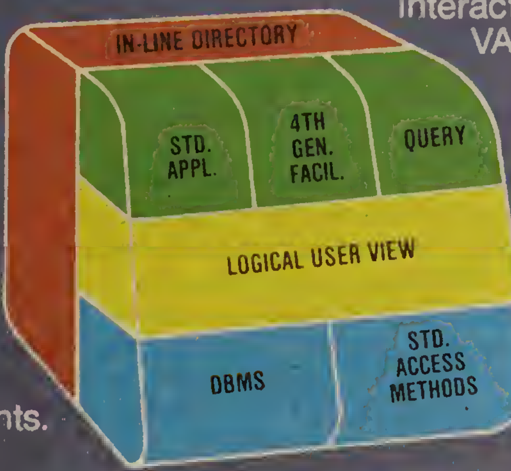

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EDITORIAL

The Right Stuff

The Michigan Supreme Court judgment affirming the difference between custom and canned software for sales tax purposes is an enlightened view that other states would do well to adopt.

At a time when the federal government is carefully rationing financial aid to the states, states are actively seeking new sources of revenue to replenish their treasuries, and the burgeoning software industry has become a likely target.

This is not to say that the explosive growth in sales of both custom and prewritten software should not become contributory factors in the states' annual budget balancing acts. But sales taxes seem clearly to be the wrong vehicle, at least where custom software is concerned.

The issue that was before the Michigan courts is similar to cases pending in courts elsewhere, namely, the tangibility of software. "Tangibility" implies substance, and sales taxes, as a general rule, apply to substantive things — clothing, machinery, books and food in some cases.

Few reasonable people will dispute the tangibility of game software and canned programs for small computers. These programs can be found in book outlets, department stores and other retail establishments and, from the outside, are indistinguishable from music tapes, records and so on. The user takes them home, inserts them into his machine, and they do what they're supposed to do without any modification from the user. Their value, intrinsic and otherwise, is contained on the tape or disk.

Indeed, only one state — Texas — exempts even game software from sales taxes. Most states agree on the tangibility and, therefore, taxability of all prewritten software.

It is the custom programs, written largely for mainframes and whose value usually extends far beyond the tapes on which they are written, that are in question. And it is the users of these programs that have initiated the suits contesting state laws taxing custom software, because it is the users who ultimately pay the 3% to 7% sales taxes.

One extreme in the custom software case is given by Ohio, which taxes everything from custom programs to routine maintenance to consultation to time-sharing services. Clearly, most of these items are services, even though the services rendered are made manifest at some point as magnetic impressions on a computer tape.

But is the service of a consultant or contract programmer working in a mainframe environment so different from that performed by a lawyer or accountant, whose services are not subject to sales taxes? Is a modified application program any different from a will in this regard?

The point is that Ohio, Massachusetts and over a dozen other states that tax custom software apply the tax to what is actually a service, to a good measure. In most states, this is clearly not the spirit of sales taxes.

In fairness, states that wish to tax custom programs should either tax similar professional services or apply a special tax to custom software whose value is, in great part, derived from intangibles. To cushion the blow to users and vendors, these same states might consider some creative use for software-derived taxes, such as earmarking the proceeds for aid to computer education.

LETTERS

Measures DP Knowledge

The editorial "Stop Dangling Carrots" [CW, Sept. 5], seems to have been written by someone with an embittered attitude toward the DP industry due to his own lack of merit badges, certificates or education.

I passed the Certificate in Data Processing (CDP) exam this year and wonder if the people who condemn or talk down the exam have actually taken it and if they have, if they passed it.

I hold two degrees, and my DP experience stems from being a computer operator, programmer and, at the present time, a systems analyst.

I did not take the CDP exam to "inflate a resume" or for a "gold star." I believe the exam measures one's basic DP knowledge and can point out areas in which a person might be weak.

Any company that would hire or promote a DP individual merely on the basis of having a CDP would be making a serious mistake. Hiring or promotions should never be based on one particular aspect of a person's credentials, but on a variety, such as experience, ability and education.

The idea behind the CDP and any test for that matter is not to "instill professionalism," but to test basic knowledge. Professionalism cannot be instilled, but is a prerequisite for taking the exam.

Those that pass the CDP exam have a certificate only; being a professional is another matter entirely.

Chris A. Wolfe
Systems Analyst
Cuyahoga Falls, Ohio

Reconsider Your Position

Ten years have passed, and *Computerworld* editorials continue the myopic narrow-mindedness characteristic of a prejudiced position.

Not that I object to *Computerworld* having an opinion, mind you, but rather that it is willing to exercise its considerable editorial power to foster a position apparently based on a stubborn, preconceived conclusion rather than on reality.

Computerworld speaks of reason in its editorial on DP certification "Stop Dangling Carrots" [CW, Sept.5]. What reason does the editorial reveal?

What I see are simplifications, misconceptions and clear misinformation. One would expect simplifications from bigots and misconceptions from poor research and scant knowledge; but misinformation from a responsible publisher is unacceptable.

Computerworld clearly has the power of the media forum, and I suspect it feels responsible. My earlier comments ought to concern *Computerworld* and to prompt investigation of its position in a responsible manner. The ethics of responsible reporting in a free society demand no less.

Should *Computerworld* take this challenge seriously, it may come to a better understanding of what "professional" means and what the Institute for Certification of Computer Professionals (ICCP) represents than is displayed in the editorial.

I, as a past president of ICCP and a current member of the board of directors, can promise *Computerworld* the opportunity for frank discussions and review of the issues.

A good idea dies hard, even when oppressed by a hostile, powerful press. In 10 years, *Computerworld* has not killed it. Isn't it about time to ask why?

There's a great story here. Maybe *Computerworld* ought to be the one to tell it.

G. Gary Casper
Director
Sysorex Institute
Cupertino, Calif.

LECHT ON SCIENCE /Charles P. Lecht

A 100G-Flops Processor: The Sixth Generation

This is the second of a three-part series on supercomputer development in the U.S.

> *'The conference served to reveal to some, and reconfirm to others, just how important our need is to create systems of devices of one billion floating point operations per second (gigaflops) capacities, that is, supercomputers, and how failure to do so would constitute the most grievous of errors. The kinds and magnitude of calculations required to pursue America's scientific research and development would simply be impossible without such systems.'*

In the first part of this series concerning the National Security Agency/Los Alamos National Laboratory Conference (NSA/LANL) on the frontiers of supercomputing (Los Alamos, N.M., Aug. 15-19, 1983), I offered my impressions of the general conference environment: its sponsors, speakers, attendees and facilities [CW, Sept. 19]. I paid my compliments to the conference and its organizers, and those compliments were sincerely meant. I also observed, although I did not elaborate at the time, that there was much accomplished at this extraordinary convocation, and I alluded, not entirely in sport, to "Year One of the Federation," harking back to the governance of galaxies that was the tacit theme of the now legendary *Star Trek* television series.

But regular readers of this column will surely have noted that there were things I did not say — for example, that the only turbulence at the NSA/LANL conference was that caused by the ceaseless tossing of bouquets and blowing of kisses across the vast spaces of the J. Robert Oppenheimer Study Center by all the experts gathered there. That's because the give-and-take did involve a measurable degree of snarling and contentiousness, along with the exchange of reasoned dialogue and politesses.

The usual self-interested groups made their appearances, right on schedule. And what some individuals saw fit to remark about others, and vice versa, surely confounded cruelty with candor. In other words, it was a nonorchestrated meeting of real people.

Divergent Views

While the conference can certainly be described as having been united by a common interest — supercomputers — it was a bit startling to witness so many divergent views on key issues and even, on occasion, to hear them expressed with passion — regarding, for example, how many supercomputers we need, when, of what power and by whom they should be paid for.

Nonetheless, the very presence of so many serious and successful scientists at the conference surely betrayed a greater commonality of goals than they might have cared publicly to own up to — idealism and patriotism often make scientists blush. Consider all this in light of the fact that it was the first meeting of its kind, and you will have to concede that it is a wonder anything of value could have come out of it.

So what, then, did? For one thing, the conference served to reveal to some, and reconfirm to others, just how important our need is to create systems of devices of one billion floating point operations per second (gigaflops) capacities, that is, supercomputers, and how failure to do so would constitute the most grievous of errors. The kinds and magnitude of calculations required to pursue America's scientific research and development would simply be impossible without such systems.

Internationally, our trade objectives would be seriously undermined; our leadership in nuclear, space, genetic, economic and other critical fields cannot be maintained by scientists using less powerful systems than those available to their colleagues abroad. And it does not require limitless imagination to see that the existence of a massive, supercomputational leviathan in even the smallest country could rapidly turn that country into a significant economic power, with little more to sell than the ideational derivations of that power.

A Few Vials of Nasty Germs

As if these were not in themselves compelling enough reasons, I call your attention to the fact that the size of a nation's territory or population is becoming increasingly irrelevant insofar as its status as a world military power is concerned. A few atomic bombs with matching suitcases, a few vials of nasty germs and the perseverance to distribute their contents in an attention-arresting way are all that modern reality requires. This represents a dramatic shift away from the tenets of conventional wisdom we have heretofore always applied in defining/perceiving strategic power. It is my opinion that a few gigaflop systems in foreign laboratories will dramatically alter our perceptions of what constitutes military might. For modern weaponry, surveillance techniques and the like depend upon supercomputers for their development, in the first place, and, ultimately, for their use as well (as in the case of applied laser technologies, for example).

The meeting also exposed great weaknesses in America's supercomputer efforts. At the head of the list was a sorry lack of imagination regarding possible applications of su-

(Continued on Page 48)

HUMAN CONNECTION /Jack Stone‡

This Country Needs a Good Portable Micro

> *'I was determined to haul along some sort of word processing capability on my forthcoming trip to the British Isles. I suppose it's because I'm hooked on the facility — a WP junkie, as it were — believing that keyboarding somehow gives life to my otherwise listless expressions. And I find myself terribly given to speech, perhaps as a sort of psychological carthasis.'*

There's no problem with stuffing a portable computer into the trunk of your car and whisking it across the Texas border into the soft-textured lands of sunny Mexico, assuming that the gendarmes will tolerate its passage. But dragging it into John F. Kennedy Airport and cramming it under a seat on a 747 jet is an altogether different matter.

There is no way I would make it past the security check what with the hulk and bulk of my machine, even without the printer.

Yet I was determined to haul along some sort of word processing capability on my forthcoming trip to the British Isles. I suppose it's because I'm hooked on the facility — a WP junkie, as it were — believing that keyboarding somehow gives life to my otherwise listless expressions. And I find myself terribly given to speech, perhaps as a sort of psychological carthasis.

My friends have remarked as to how wonderful it is that I can give vent to my verbosity through the medium of a machine rather than inflicting my rushing words on them.

So I began trudging around in the footsteps of those many thousands of weary buyers who are trying to figure out what make and model of portable machine to buy.

In store after store, I presented my needs: "Portability is paramount. I should be able to stow it aboard a commercial airliner. It should be no more than 5 pounds, but I'll settle for 10. Word processing software should be very simple. I want a tube that I can see without a telescope. I can do without a print capability on the road, as long as the machine will drive the printer from my current system when I get back home."

I looked at a computer from Osborne Computer Corp. (at the time, the sales personnel were not pushing the machine too hard, for reasons that have recently become painfully clear), a system from Kaypro, Inc. and Otrona Corp.'s Attache, but they were all too heavy.

I turned to the battery-operated "laps" and found that only Radio Shack's TRS-100 had a word processing feature and that was a built-in read-only memory (ROM) package.

I quickly imagined myself pounding away at its keyboard and unraveling some mystery of computer life, while driving along a mountainous road somewhere in the Scottish Highlands.

At first blush, the TRS-100 looked awfully good, what with its weighing in at four pounds. Also, it provides a cute little file manager, again ROM-based, with a simple search function.

The machine sports a built-in modem, but I have no practical use for this feature, other than as an item for discussion at a cocktail party. And, sure enough, there was an RS-232 serial interface for my printer peeking out of its backside.

I trundled the printer over to the local Radio Shack, all 36 pounds of it, just to make doubly certain that there was no connection problem.

I'll Never Know

Well, I'll never know if there is one because the salesman didn't have the slightest idea about what controls to use to drive the printer. As he struggled to find them, I looked over the operating manual and discovered, much to my dismay, that Tandy apparently released the machine, or at least the word processing function, only partially completed.

It's easy enough to enter text, and the editing features are nifty, but there are no print format capabilities other than line width selection and an option to print either a screen or the entire file. Reluctantly, I was forced to abandon the notion of a lap.

The solution to my needs? For the time being, I'm going peripheral instead of mainframe, and analog at that. I'm taking a two-pound audio tape recorder, a remote microphone and a mess of cassettes that I'll transcribe and pump into my machine when I return.

The Sixth Generation

(Continued from Page 47)

percomputer technology. It was this dearth of imagination that inspired some of the ludicrously low estimates of how many supercomputers could practically be employed in this country (or elsewhere) that we heard. Not surprisingly, this led to a pitch for government subsidies for supercomputer development.

Although I agree that there is legitimate reason to support such subsidies, I could not agree with the estimates made at the conference of how many supercomputers might be needed; and I was genuinely flabbergasted by the paucity and unoriginality of the ideas proposed for applying the powers of these machines. You would think there was no commercial marketplace at all and that beyond doing incredibly fast arithmetic, the systems were utterly useless.

True, architectures other than those found in our current supercomputers are needed if their application to the commercial sector is to be widened; but these are already known. The beautiful promise of our emerging integrated services digital network technology to distribute the powers engendered by computer systems everywhere, like telephone service, is predicated upon the availability of ever faster and larger capacity systems than those currently in existence.

Need I do more than cite the fantastic commercial rewards implicit in holographic projection to make my case? Or the widespread availability of artificial intelligence (while we're waiting for the real stuff to mature)?

> *'Commercial applications of supercomputer systems rival those found for fuel . . . We learned that we don't need the goad of recent Japanese successes in electronics any more than we need the technological triumphs of Germany or France or any other nation to motivate us to continue our supercomputer efforts. . . . Our requirement for supercomputers is a far larger issue than our perceived need to beat the pants off any single foreign country. Our competition is with all of them.'*

The possible commercial applications of supercomputer systems rival those found for fuel (of all sorts), and their impact on our future lives will be no less. And we learned that we don't need the goad of recent Japanese successes in electronics any more than we need the technological triumphs of Germany or France or any other nation to motivate us to continue our supercomputer efforts. The requirement — our requirement — for supercomputers is a far larger issue than our perceived need to beat the pants off any single foreign country. Our competition is with all of them.

I left Los Alamos with the uneasy feeling that our identification of Japan as the country to beat in the world computer marketplace is unhealthful. For if we really believe that they learned everything they know from us and are now beating us at our own game, then it must be terribly demoralizing to those American scientists who were the classmates of today's successful Japanese scientific leadership to feel that they (the Americans) have been adjudged de facto retardates in its playing.

I, for one, do not subscribe to this insulting opinion. We must protect our scientific community from such unwarranted, and surely unintended, slurs. That Japan accounts for less than 3% of the world computer systems marketplace, whereas American manufacturers effectively dominate it, more nearly embodies the truth of the issue.

We've beaten the pants off the Japanese computer industry — and it was our scientists who did it. That is not to say that we cannot improve, or that others are not improving, making it safe for us to rest on our laurels. To avoid the dangers inherent in such resting, someone must enunciate a national goal for American computer science achievement, like a 100G-Flops processor. Call it the sixth generation, and let's get on with it.

Lecht is chairman of Lecht Sciences, Inc., a New York-based think tank specializing in computer and communications technologies.

LETTERS

Training Pays Off

Larry Long's Turnaround Time column [CW, Sept. 5] really hit home.

I have worked in two DP shops over nearly three years and have received no formal training in either place. What I did learn from one DP position didn't transfer well to the next job.

Experience in one organization on one system can be totally unlike the experience in another organization on a different system. Thus, whether one's talking about entry-level or experienced DPers, it is absolutely essential that DP shops give employees adequate training. This doesn't mean just tossing them manuals. It means hands-on training, mixed with in-house classes, professional seminars and membership of employees in professional organizations.

The uncertainty of trying to work on something and not knowing what you're doing is frustrating, not to mention inefficient.

To expect ready-trained employees either from other DP shops or colleges is totally unrealistic. To be willing to expend nothing on training for fear the employee will seek greener pastures is a self-fulfilling prophesy.

Karen L. Edwards
Nelson Division
TRW
Lorain, Ohio

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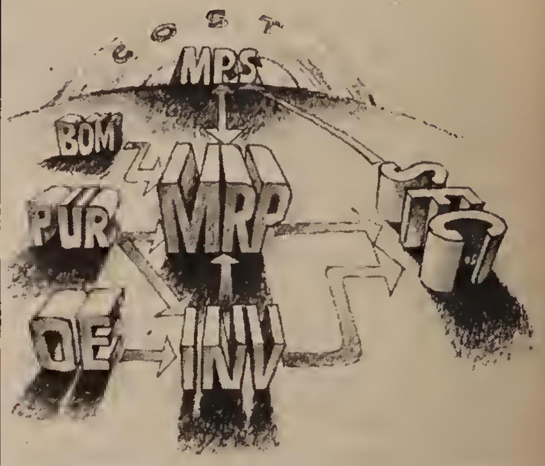

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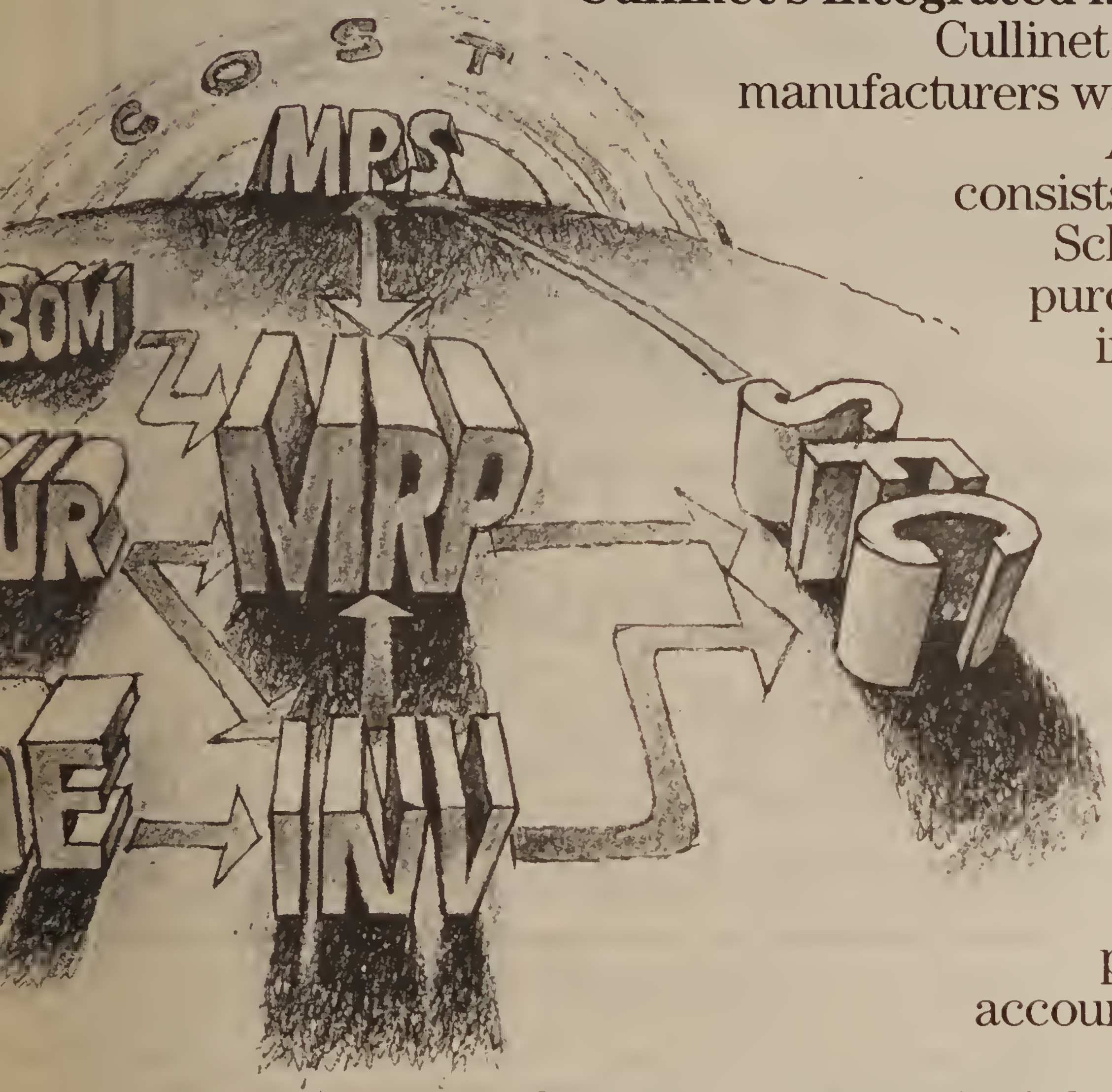

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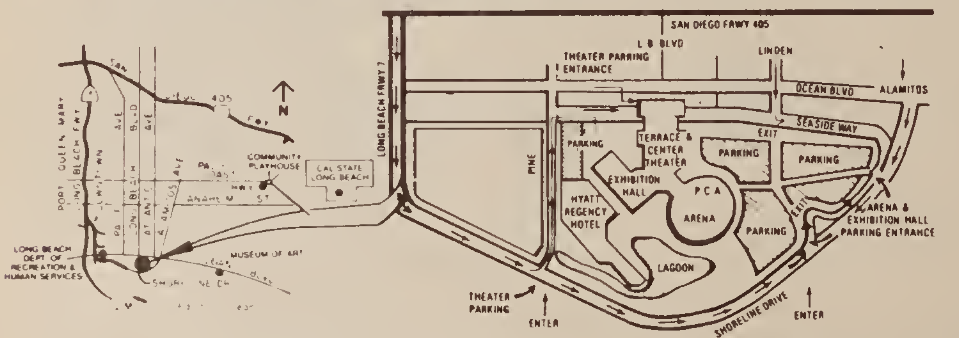

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OS CICS Users Get 'Umax,' Utilization Monitor

MCLEAN, Va. — Johnson Systems, Inc. has released Version 3.1 of the CICS Utilization Monitor and Chargeback System (Umax) for OS CICS users.

The latest version of Umax, a data collection and reporting tool, offers full support for OS CICS/VS Release 1.6 and 1.5, independent real CPU time and paging statistics data collection and security enhancements to permit users to screen Umax transactions and prevent unauthorized execution, Johnson said.

In addition, the system provides virtual storage constraint relief through individual file and program-level collection techniques, as well as a file-nesting level indicator.

The cost of the OS Umax system is $6,000 from Johnson Systems at 8300 Greensboro Drive, McLean, Va. 22102.

Production Control Involves Complex Weave

By Layne Bradley
Special to CW‡

One area within the data center that is receiving much attention with regard to productivity issues is automated scheduling and production control. The production control environment involves an extremely complex group of interrelated tasks and responsibilities such as data entry, job preparation, work load scheduling, abend recovery and resolution and reports production and distribution.

In production control raw input is processed through several workstations into a deliverable product for the customer. Thus there are many labor-intensive, repetitive activities involved. The productivity issues address two aspects:

- How can the activities be automated to increase work flow through the system?
- How can the activities be combined or eliminated in such a way as to reduce the number of people required to run the system?

In a production environment there are several work areas through which work must flow. Thus, one function which production control systems must perform is to track work through these various workstations. Mere tracking is not sufficient, however. The system must provide information on a real-time basis.

Each workstation has different requirements. For example, in a data entry work area the primary concern is receipt and logging of input data, preparation of the data and transmission of data in some manner. A production control system should be able to provide rapid information, such as the arrival time of data, the time data was prepared for transmission and the volume of data that has been received.

In addition, an automated system should provide some preemptive control. If, for example, input data is scheduled to be submitted by the user at a certain time and isn't, the production control system should automatically and immediately alert appropriate personnel.

Activities in the job-setup workstation typically involve making temporary changes to job control language, rearranging job or step sequences, inserting necessary parameter information or adding instructive comments.

The automated production control system should "remember" all the tasks required for a particular job. It should allow requirements to be defined ahead of time and then automatically inform the opera-

(Continued on Page 56)

Application Development Tools Serve Gcos-Based Large Systems

PHOENIX — Honeywell, Inc. has announced five application development facilities for its Gcos-based large-scale systems. These products are designed to enhance programmer productivity by providing new language processors, forms options, program generators and testing models, the company said.

These five products are the first to be acquired by Honeywell's program of externally sourced products for bringing third-party software to a Honeywell large-scale environment. They include the Transaction Screen Management (TSM) system, Transaction Application Test System (Tats), System-80 automatic program generator, the Softool set of programming tools and the C programming language. All five facilities operate on Honeywell's DPS 88, DPS 8 or DPS 66 large computers under Gcos Release 4JS3 or Gcos 8 Releases 2000 and 2300.

The TSM system is designed to aid terminal-independent program design of online applications programs in the DM-IV transaction processing environment. According to Honeywell, TSM relieves the programmer from coding network-dependent information such as forms control data for terminals and security control mechanisms.

TSM comprises a set of DM-IV transaction processing programs, a supporting IDS/II data base and a set of Cobol-74 batch utility programs. The system requires at least one Honeywell VIP 7800 terminal for operation and also will support the VIP 7700 and terminal systems with VIP emulation capabilities.

TSM is available for a one-time license

(Continued on Page 56)

'Calc/1' Spreadsheet Upgraded

SAN FRANCISCO — H & A Computer Products, Inc. has announced an enhanced version of the IBM Calc/1 electronic spreadsheet originally introduced in August of 1982.

The Calc/1 is modeled on the more popular spreadsheet programs available for personal computers. It is designed for IBM EDX Series/1 processors with 4978/79 or 3101 terminals.

The enhanced Calc/1 now provides a "virtual" spreadsheet allowing a 254-row by 63-col work sheet to be processed within Calc/1's minimum 32K-byte memory requirement. The enhanced version of the Calc/1 is priced at $500.

The vendor specializes in software products for EDX Series/1 development, performance measurement and data communications. H & A Computer Products is located at Suite 204, 30 Hoteling Place, San Francisco, Calif. 94111.

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Most of our publications are weekly newspapers, because so many things happen so rapidly in the computer business (as the headline quote from a prominent industry executive makes so clear). In only thirty years the industry has gone from the development of the giant Eniac system, through the tube-powered, water-cooled Univac I (the world's first business computer), to the incredibly cheap, battery-powered microprocessor.

But as unbelievable as the last 30 years have been, the next 30 will probably be even more incredible. In the next two years alone, the installed power of general purpose computer systems will grow almost as much as it did in the previous 16 years. And the supercomputers of the 90's will transfer data at a rate several hundred times faster than even today's speedy computers! It's hard to remember this is real science, not fiction.

This extraordinary increase in efficiency has led to a rapid expansion in computer use, as human ingenuity finds more and more applications for these powerful tools. So the market for computer products and services has turned out to be more elastic than most observers had thought. Worldwide expenditures are currently at $90 Billion, and growing by 20% a year.

A constant flow of new products; rapid changes in technology; more and more new applications; and large and growing expenditures. It's an industry with a strong need for current, complete and accurate information. Which is where we come in.

Our oldest publication is COMPUTERWORLD, a weekly newspaper with a growing all-paid circulation in excess of 120,000 (quite an increase from our modest 7,500 in 1967).

COMPUTERWORLD serves America's computer users with the consumer-oriented, objective information they need. And it has become America's top business/professional publication, measured by advertising revenue.

ISO WORLD is our semi-monthly publication for retailers, dealers, distributors and other independent sales organizations (ISOs) in the resellers marketplace. This is a relatively new marketplace which has grown up around the minicomputer and microcomputer, and which shows every sign of very rapid growth for at least the next decade.

The latest phenomenon of the computer industry is personal and desk-top computers and we're covering it with our newest publication, INFOWORLD and PC WORLD. INFOWORLD is a weekly newspaper for all micro users and it features complete software and hardware reviews, while PC WORLD is a monthly magazine devoted to users of the IBM PC and compatibles.

The United States alone accounts for nearly half of the worldwide computer market, but billions of dollars are spent by foreign computer people for American-made computers and computer products. And our publications penetrate those marketplaces, too.

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'Omnicalc' Release Provides Spreadsheet Capabilities

IRVINE, Calif. — Tower Systems, Inc. has announced Release 4 of Omnicalc, which provides users with spreadsheet capabilities while utilizing the power of existing mainframe terminals.

Release 4 features cell formula entry, support for IBM's VM/CMS and TSO, variable cell widths, online print capabilities, support for color and extended attributes, three-dimensional screen display and bar graphs.

The product was designed for IBM's CICS environment. Monthly rental prices begin at $295 from Suite 365, 19782 MacArthur Blvd., Irvine, Calif. 92715.

Designed for Flexibiltiy

Financial Control System Debuts

NEW YORK — Data Design Associates, Inc., a supplier of financial applications software for medium-scale to large computers, has announced the development of a general ledger financial control system that allows corporate end users greater flexibility in tailoring financial data to their needs than any existing software.

According to a vendor spokesman, the new system incorporates English-language user commands, a personal computer interface, online data entry and inquiry and other features aimed at simplifying data base access.

The features are aimed at putting the power of the system in end users' hands.

Installations of the general ledger financial control system will begin the first quarter of 1984 with a base price ranging from $60,000 to $86,000.

More information is available from the vendor at Suite 310, 1250 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Multitask Upgrades 'Libxref'

WEST HARTFORD, Conn. — Multitask, Inc. has announced an enhancement designed to enable its Libxref software tool to load and maintain data dictionaries on IBM mainframes.

The User Report Generation Package (URGP) assists users to populate and keep current data dictionaries, the vendor said. Libxref, a cross-reference and documentation productivity tool, captures all cross-reference data for the dictionary, which can be used to manipulate and scrub data.

The URGP is supplied with reusable source code routines that can be modified to load data into any data dictionary system, Multitask said. It is designed for use in all major IBM mainframe operating systems.

Libxref prices start from $7,000 from Multitask, 1007 Farmington Ave., West Hartford, Conn. 06107.

Payroll Tool Unveiled For Wang VS

WHEATON, Ill. — An online payroll and personnel package for use on Wang Laboratories, Inc. VS series minicomputers has been announced by Generated Systems, Inc.

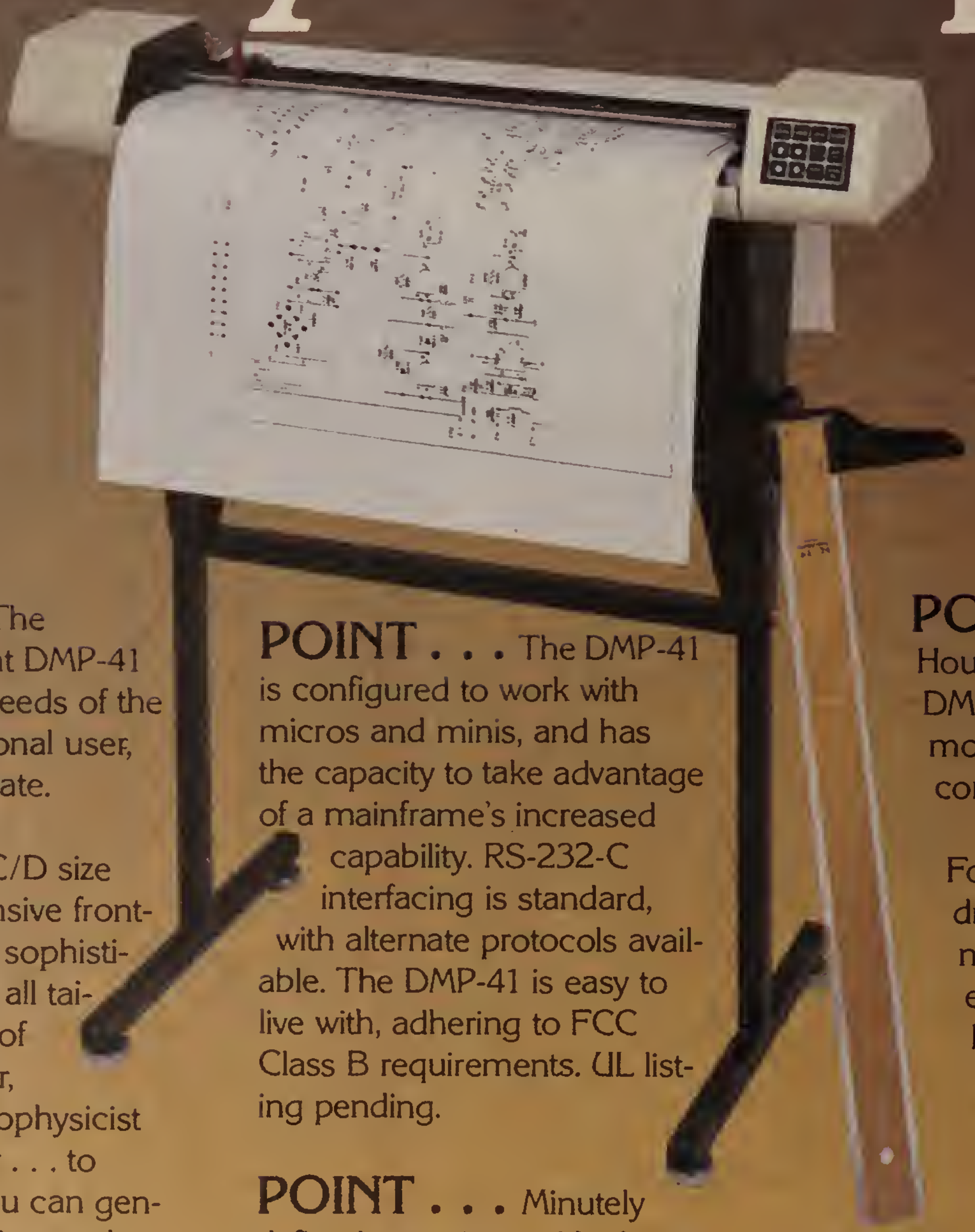
The Payroll/Personnel System is based on a system that was originally designed for use on IBM mainframes, a company spokesman said.

It reportedly utilizes an integrated file structure for all employee data and features unlimited tracking of earnings, taxes and deductions for each employee. The system can handle multiple companies, payrolls and frequencies, the vendor said.

Written in Ansi 74 Cobol, the system may be used on Wang systems starting with the VS25. Source code is provided.

Software is priced from $15,000, and complete systems with hardware start at $45,000 from Generated Systems, 209 N. Hale St., Wheaton, Ill. 60187.

It's easy to make points when you're a pro.



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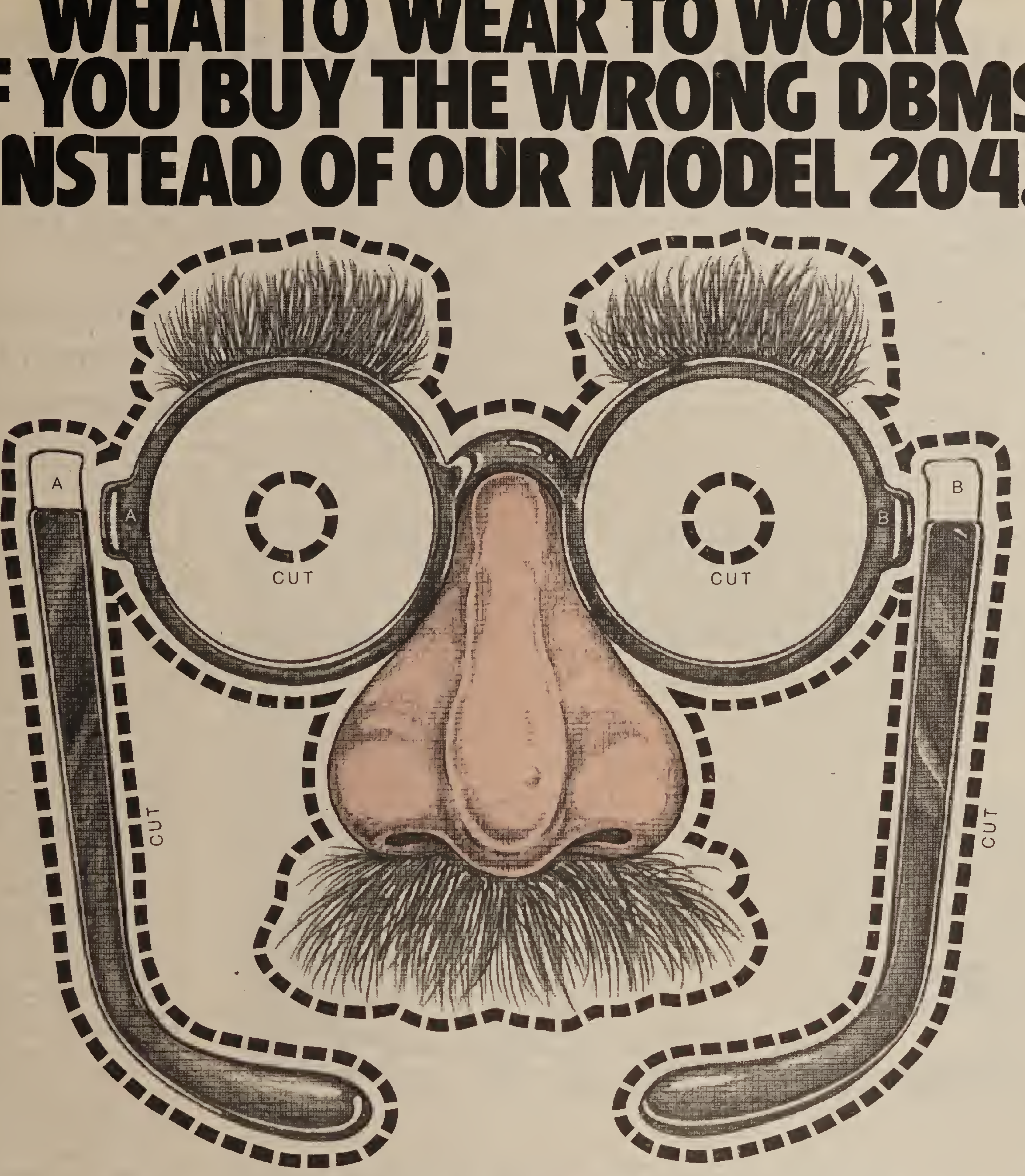

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1. *Datapro:* "User Ratings of Proprietary Software-COMPLETE" November 1982. 2. *Computerworld:* December 20, 1982.

Other Offices: New York, Houston, Dallas, Los Angeles, San Francisco, Chicago, Philadelphia, Washington, D.C., Morristown, NJ, Stamford, CT/Representatives: Canada, U.K., Europe, Australia, Japan, Saudi Arabia.

Five Application Tools Fit Gcos-Based Systems

(Continued from Page 51)

fee of $24,000 or $980/mo for a minimum of one year.

The Tats package is a time-sharing software tool for interactively writing, compiling, testing and debugging application procedures outside the transaction processing environment. It utilizes a program skeleton generator and forms mode terminal to build and debug a single transaction. Once completed, routines are compiled through Cobol-interactive commands, a Honeywell spokesman said.

The one-time license fee for Tats is $10,800. It can also be licensed monthly for $580 for a minimum of one year. Tats is available immediately.

System-80 is a set of two software tools designed to facilitate routine Cobol program development tasks such as coding, maintenance and documentation. The Cobol program generator produces menu-driven data entry and file maintenance programs that interact with the user while executing, according to Honeywell.

The System-80 products are scheduled for availability in October. The Cobol program generator costs $18,400 for one-time licensing or $780/mo, while the report generator is $9,900 or $430/mo.

Honeywell's Softool products, which the company said can provide facilities to support software life cycles, increase programmer productivity, facilitate software maintenance and improve management visibility and control, are comprised of two products: a Cobol programming environment and a change and configuration control (CCC) package.

The Softool program set is offered in three different packages. Cobol programming environment will be available in October for a one-time charge of $33,500 or $1,400/mo. CCC is available now for $30,000 or $1,500/mo. Both Softool components can be acquired for $60,000 or $2,500/mo for a minimum of 12 months.

C is a general-purpose programming language that deals with characters, numbers and addresses designed for writing real-time numerical, text processing and data base programs.

The one-time license fee for C, available immediately, is $8,000. It can also be licensed for $340/mo.

Information about all five programming tools is available from Honeywell through P.O. Box 8000/T-60, Phoenix, Ariz. 85066.

Scheduling, Product Control Interrelated

(Continued from Page 51)

tor of the need to accomplish the required tasks. It should notify appropriate personnel of the necessary requirements at the scheduled time and date. It should provide readily accessible documentation or instructions for personnel unfamiliar with the tasks and provide notification to the operator whether the changes are successful or unsuccessful.

The CPU is certainly a workstation in the production work flow. Many hardware and software tools are available to help improve its performance. Since the control of job processing is handled well by the CPU, the production control system should ensure that work is submitted in an orderly, scheduled manner to ensure timely delivery or output.

Work should be scheduled taking into consideration resources allocated for production processing, business priorities, due-out times, predecessor/successor relationships, data availability, date and time. The system should allow the routine work to be easily predefined and automatically submitted with little or no operator intervention.

Another important area is abend handling and recovery from system failure. Since time is usually critical in production work, the system should allow rapid correction and resubmittal of individual jobs as well as recovery and backup for the entire system.

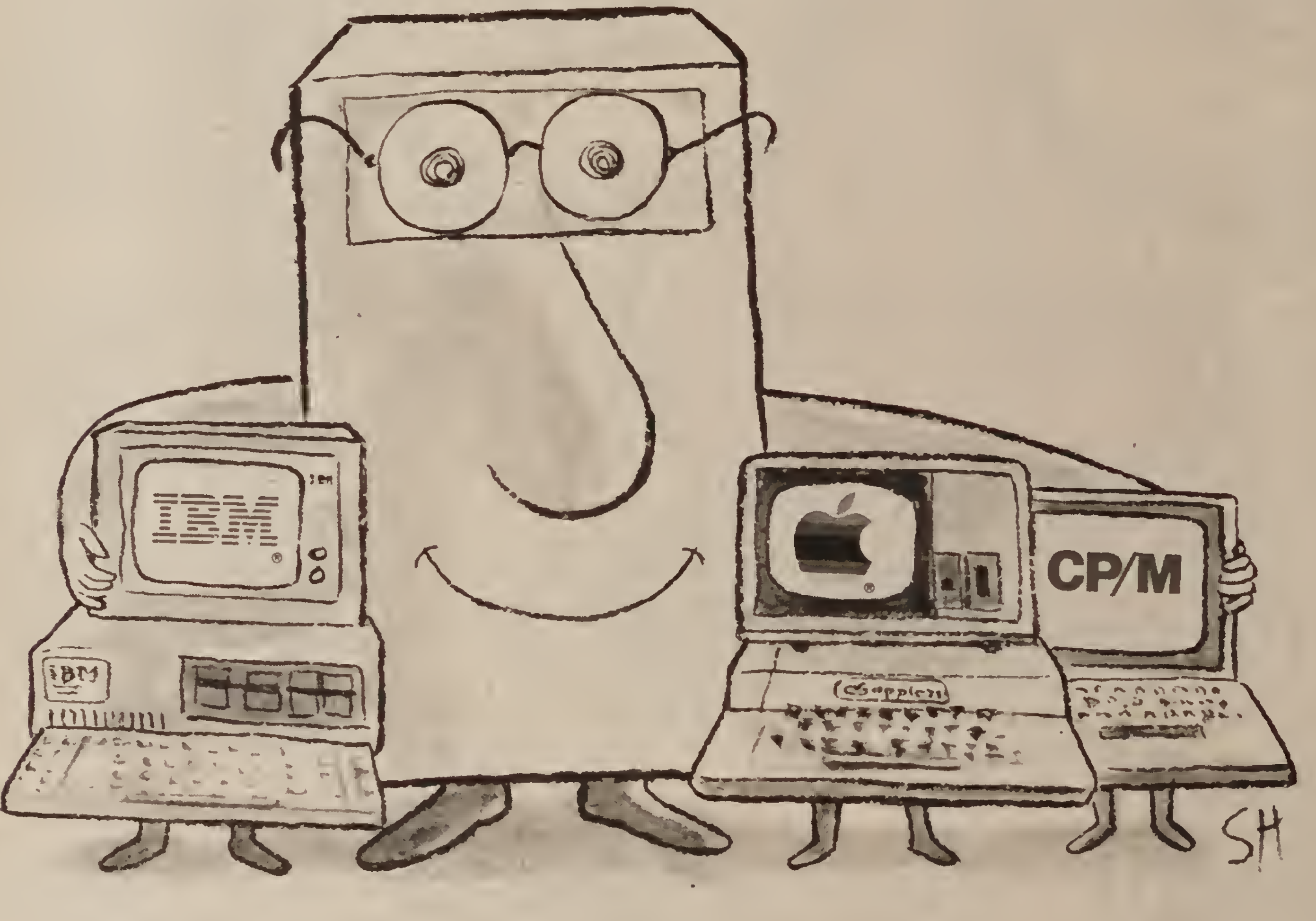
To be completely effective, the production control system must not only handle the majority of ongoing work automatically, it must also provide flexible capabilities for nonroutine tasks. It must offer complete, readily accessible information concerning the overall status of work flowing through the system and rapid notification of problem areas.

Control and tracking capabilities should also be available for the output distribution work areas. The system should be able to track individual reports from the time they are created through the various report processing activities to the final distribution.

Other information should include number of copies of a report, number of reports created and distribution information.

Reporting is the final function to be automated. The production control system should provide a wide range of technical reporting capabilities for performance tuning as well as management reporting for decision support.

Bradley is a marketing manager at University Computing Co. in Dallas.



Your micros need never stand alone again.

One of the liveliest topics among MIS managers is how to effectively transfer files between all those corporate microcomputers and an IBM mainframe.

Today, one solution stands out: OBS FTP.

FTP is a general purpose, utility program that provides 2-way file transfer between micros and IBM mainframe computers.

FTP was originally developed by UCLA and first introduced in mid-1982. It represents the state of the art in asynchronous file transfer.

The product comes in two parts. Host FTP runs under TSO or VM/CMS at the mainframe, while Micro FTP runs on the IBM PC (PC-DOS), Apple II, or II+ (DOS or CP/M) and 8080 and Z80 processors running CP/M.

Full data transparency

Unlike other file transfer alternatives, OBS FTP can transfer either text or binary files. This allows you to upload and download object programs or other non-text files. FTP uses a layered protocol featuring the exchange of 1K/byte packets to speed transmission.

Guaranteed reliability

Other micro communication packages may allow you to dial a host-based editor to transfer text files. But they only transfer one line at a time. And they can't prevent data loss or recover from transfer errors.

FTP offers a 16-bit Cyclic Redundancy Check (CRC) that is calculated by the sending program and recalculated by the receiving program. If the calculations don't match, FTP automatically tries again.

Highly flexible, easy to use

Programmers can download a source program to their micro at home, complete the program, and upload it for compiling and testing.

And think of the redundant diskettes you save. Archival data, backed-up files and programs can all be stored at the mainframe until they're needed by the PC user.

Micro FTP includes a terminal emulator so your micro can sign on to VM/CMS or TSO.

To upload or download a file, the user simply provides the file names and issues a single command. FTP will operate at line speeds that are limited only by your communications hardware.

OBS Software has been a vendor of IBM systems software solutions since 1977. We understand mainframe organizations and speak your language. You can count on us for solid support when you need it.

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Informatics Updates Mark V For IBM CICS Environments

WOODLAND HILLS, Calif. — Informatics General Corp. has introduced Release 4.1 of its on-line application generation package for users of IBM mainframes. The firm also announced that its Mark V package can be used in IBM CICS environments.

The addition of CICS compatibility to the basic Mark V package for IBM IMS/Data Communications (DC) environments provides teleprocessing portability for design, implementation, documentation and maintenance of on-line systems with performance-critical environments, the vendor said.

A major enhancement included in both the IMS and CICS versions of Release 4.1 is output of a design manual on request with every generated application.

This document reportedly includes overall summaries on screen-to-screen flow, data base usage, a field reference index and summaries for each individual screen.

Other enhancements to Release 4.1 include: support for the PL/I programming language in an IMS/DC environment and the ability to install the Mark V package on IBM 3380 disk drives, the vendor said.

Release 4.1 is offered free to current Mark V users. For new users the Mark V package costs approximately $100,000. The CICS versions of Mark V cost $36,000 for an OS environment and $24,000 for a DOS environment.

Informatics General is located at 21031 Ventura Blvd., Woodland Hills, Calif. 91364.

Monitor, Service Announced For IBM VM

RIDGEFIELD, Conn. — Adesse Corp. has announced the VM Online Performance Monitor (Vmon) for IBM VM operating environments.

The firm is also offering a service designed to identify performance problems at virtual machine installations.

The Vmon package is a general-purpose tool for use in performance problem determination activities. The package can reportedly produce output for full-screen or line-mode terminals that is tailored to a specific analysis situation. Vmon can be used for analysis of virtual machine performance problems, as well as for performing I/O subsystem studies.

Vmon offers display formats that can be tailored to provide a variety of information in a usable form. In addition, the package can make use of the highlighting and color capabilities of IBM 3270 series CRT terminals, and displayed output can be captured in spool files for later examination.

The program operates interactively and allows ad hoc performance problem analysis. This allows virtual machines to be grouped for aggregate analysis or for exclusion from a display, the vendor said.

The Vmon package can be leased on a per-CPU basis for $310/mo and purchased for $5,500. Maintenance is included in the monthly charge, while customers who purchase Vmon must pay a $60/mo charge for maintenance, the vendor said.

The Vmap analysis service includes a one-time analysis of a computer system running VM/370 or VM/SP either with guest operating systems, CMS or both.

The study includes an annotated copy of the analytic reports, showing likely bottlenecks, performance hitches, high loads or overloads.

The analysis service costs $875 from Adesse, P.O. Box 515, Ridgefield, Conn. 06877.

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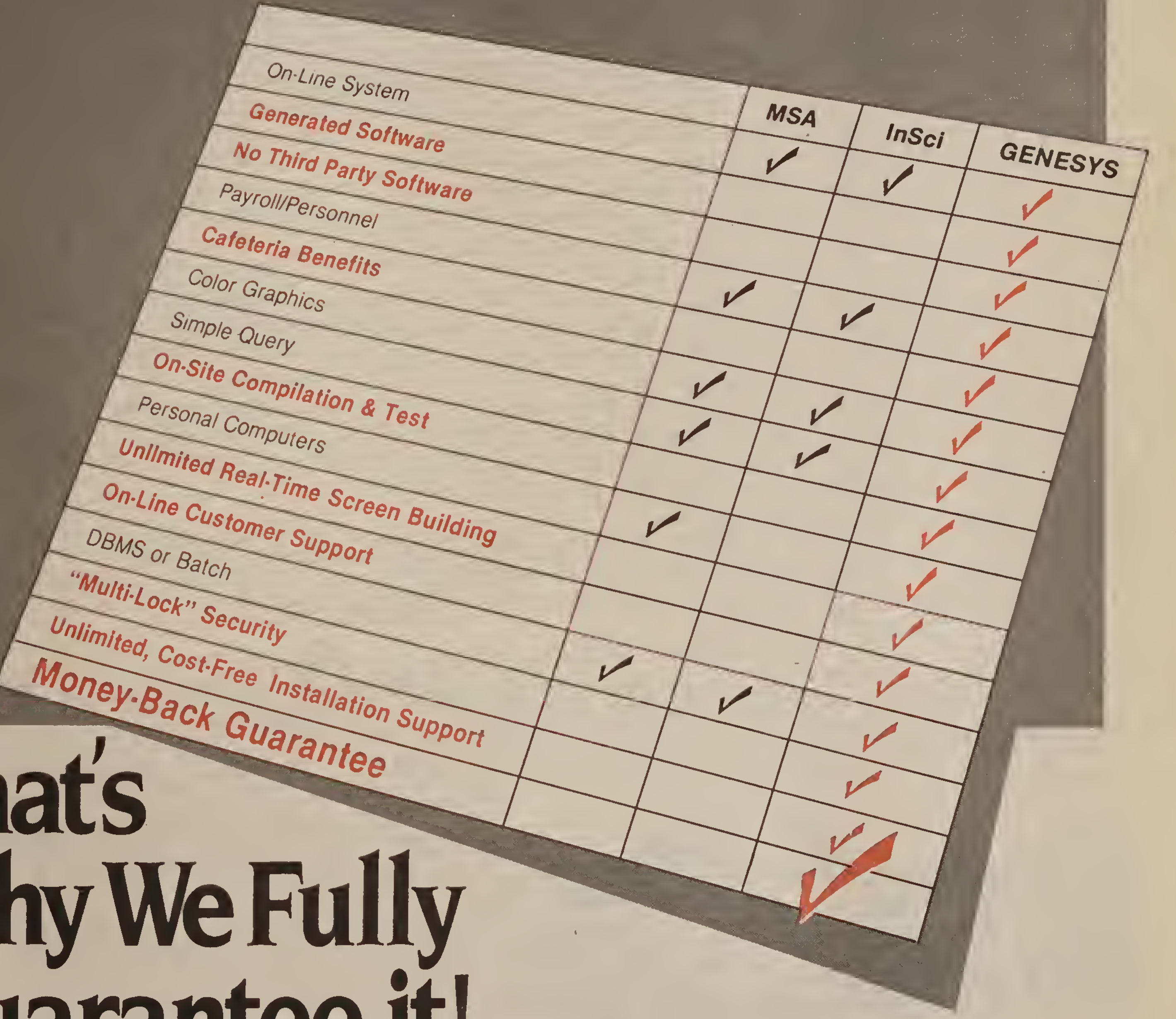
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SYSD Maintenance System for CICS Enhanced

BOISE, Idaho — H & W Computer Systems, Inc. has announced Release 3.3 of SYSD, its source program maintenance system for CICS.

According to the vendor, the new release includes the following:

- A flexible partitioned data set editor features commands to copy, move, insert, replicate, add, delete and change individual or groups of lines.
- A user-friendly spool display system allows viewing of the entire job or access to specific reports. Special commands include search for character string, display of condition codes, end of reports and browse forward and backward.
- A spool printing system provides an economical means of distributing job entry system reports to remote locations with the high cost of remote job entry terminals.
- A direct access storage device management system allows users to scratch, rename, catalog and uncatalog data sets or to create generation data groups.
- Complete security exists at the function, subfunction, command and report levels.
- Support exists for CICS 1.6, MVS/XA and JES2 SP1.3.3.

SYSD reportedly operates under VS1 and MVS operating systems with CICS/VS Release 1.4 and above. Site licenses are available for $8,500, with the first year of maintenance included. A 30-day free trial is available to qualified prospects, according to a spokesman for the vendor.

More information on SYSD is available from H & W Computer Systems through P.O. Box 4785, Boise, Idaho 83711.

Buffer Control Software Links Prime Systems to Micros, Nets

WOOD DALE, Ill. — Computronics, Inc. has announced the release of its input buffer control software for users who wish to connect their Prime Computer, Inc. systems to microcomputers, local-area networks or other high-speed equipment.

A modification of the existing Primos package, the software provides a buffer control for data coming into a Prime system on any asynchronous communications line. When a user has the input buffer control and the Prime computer buffers approach the full state, the Prime will send a Control-S to the microcomputer, local-area network or other device. When Prime catches up and the Primos buffer is nearly empty, the Prime will send a Control-Q character.

No extra software is needed on the remote device to support the operation. The buffer control feature can be enabled or disabled on a line-by-line basis. It is available for all Prime 50 series systems, including the Prime 2250. It will also work on the Prime 400 and 500.

The price of the input buffer control is $600, which includes a one-year warranty and all new releases of Primos that are required during the time period. A maintenance contract can be purchased after the one-year period for $200 a year.

Prices are for single computer systems. Prices for additional systems are two-thirds of the above prices for software and maintenance. A license covering the total number of systems on which the software will be used must be purchased.

Computronics is located at 130 North Ash, Wood Dale, Ill. 60191.

Financial Software Announced for Mark III Net

ROCKVILLE, Md. — A comprehensive, personal financial planning software system is now available on the Mark III teleprocessing network, General Electric Information Services Co. (Geisco) announced.

Execplan, developed by J. P. Sawhney & Co. of New York, reportedly provides a flexible system for financial planners to produce a comprehensive personal financial plan.

Execplan provides two modes of personal financial planning, according to the vendor.

Executive planning reportedly provides planning analysis reports, estate tax statements, left-to-heirs balance sheets and estate distribution flow charts; tax planning provides income tax alternatives and estate analysis.

Costs for using the system to develop a financial plan typically range from $30 to $150, according to a spokesman for the vendor.

More information is available from Geisco, 401 N. Washington St., Rockville, Md. 20850.

Jspool Driver Released For DOS 2.0

PALO ALTO, Calif. — Tall Tree Systems has announced the release of Jspool, an installable device driver for DOS 2.0.

Compatible with both parallel and serial interface ports, Jspool allows Xon/Xoff protocol and has nine special processing commands. These commands can be input by the user directly or placed at the top of text files and automatically input as the spooler processes each file, a spokesman said.

With these commands, the user can set tabs, odd/even page boundaries and the communications rate. These commands also control pausing or continuing print execution, flushing the spooler buffer and directing the output to one of seven printers, the spokesman added.

With Jspool, the size of the spooler buffer may be changed from 2K bytes up to 2M bytes. It is available now for $40, including source code for the drivers, from Tall Tree Systems, 1032 Elwell Court, No. 124, Palo Alto, Calif. 94303.

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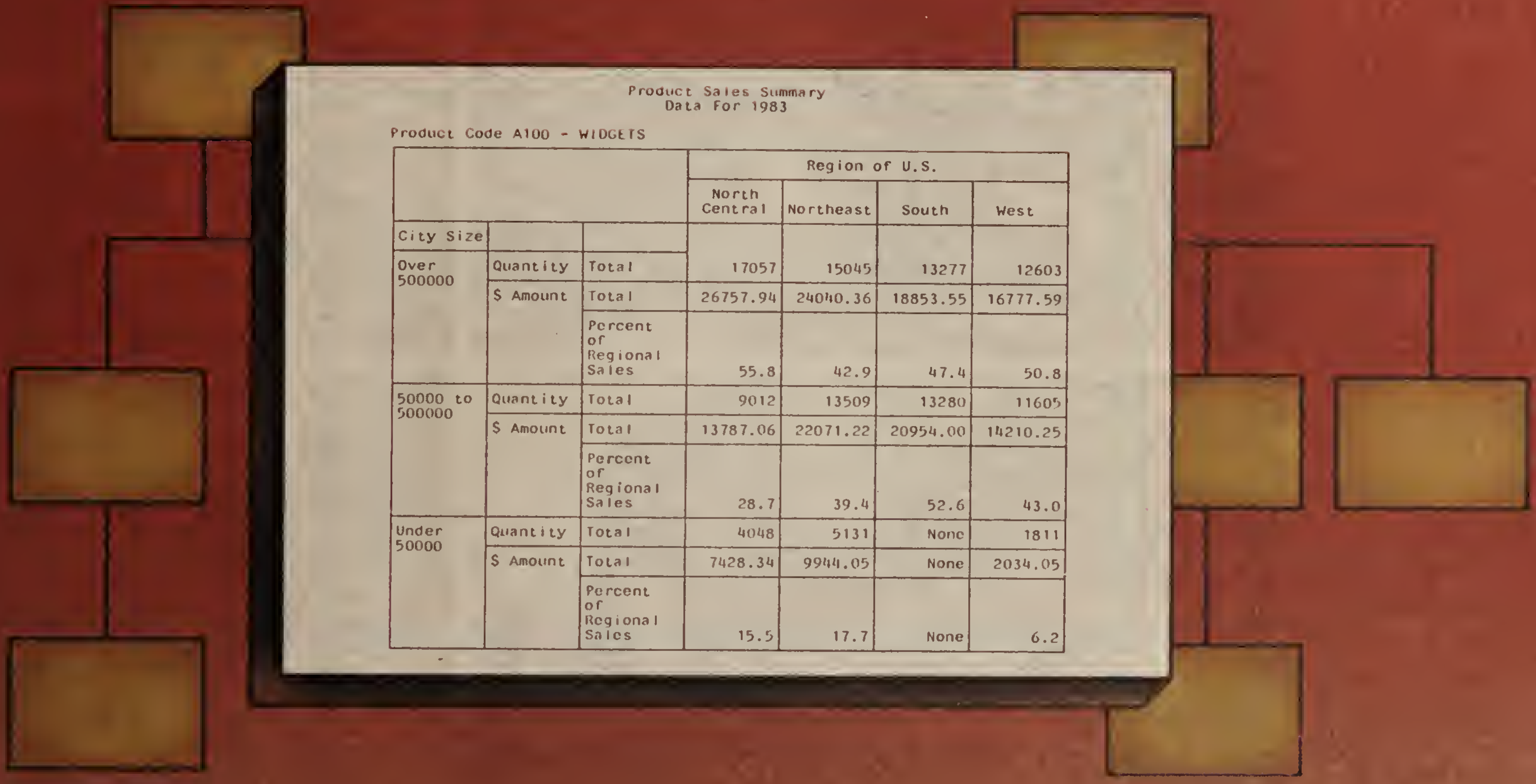

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			Region of U.S.			
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Over 500000	Quantity	Total	17057	15045	13277	12603
	$ Amount	Total	26757.94	24040.36	18853.55	16777.59
		Percent of Regional Sales	55.8	42.9	47.4	50.8
50000 to 500000	Quantity	Total	9012	13509	13280	11605
	$ Amount	Total	13787.06	22071.22	20954.00	14210.25
		Percent of Regional Sales	28.7	39.4	52.6	43.0
Under 50000	Quantity	Total	4048	5131	None	1811
	$ Amount	Total	7428.34	9944.05	None	2034.05
		Percent of Regional Sales	15.5	17.7	None	6.2

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Boasts More Than 60 Variables

Text Editor Out for DEC VAX-11s

CAMBRIDGE, Mass. — Computer Corp. of America has introduced the Emacs text editor for Digital Equipment Corp.'s VAX-11 systems.

The product features more than 60 user-defined variables that allow the operator to customize Emacs to meet various application needs and different user styles. These include: horizontal and vertical multiwindowing; a set of forward and backward movement, deletion, justification, filling, centering and transposition commands for characters, words, sentences, paragraphs, program expressions and arbitrary regions; text editing functions such as incremental search and query replace, automatic case adjustment, word abbreviation, movement of rectangular regions within tables and interactive spelling checking and correction; and a directory editor that allows viewing and modifying files and directory.

The product runs under DEC's VMS operating system or the University of California at Berkeley's version of the Unix operating system.

Emacs is priced from $350 to $850. Volume discounts and special rates for OEMs and educational institutions are available, Computer Corp. of America said from Four Cambridge Center, Cambridge, Mass. 02142.

'Capeditor' for Wang VS Handles Cobol Applications

TORONTO — A Cobol text editor for Wang VS series computers has been announced by Netron, Inc., which said the product features advanced diagnostics, logging and recovery facilities.

The product is an addition to Netron's Computer-Aided Programming (CAP) automated application development and maintenance system. Capeditor reportedly features an on-line documentation system that can be accessed from any program by a single keystroke.

The product is available separately for $3,000 or as a component of CAP Release 3.0.0, which costs $32,000. More information can be obtained from Netron at 99 St. Regis Crescent N., Downsview, Canada M3J 1Y9.

T/S Service Enhances Program

BOULDER, Colo. — Tentime, a time-sharing service, said it has added to the financial modeling program it developed for Applied Data Research, Inc.'s decision support system.

The added features to Applied Data's Empire system include on-line computer-based instruction, forecasting, graphics, assumption analysis graphics, simultaneous equations, directory searching and editing, the vendor said.

The program also permits access to its own internal line editor, as well as to system editors.

The entire system is currently available from the vendor for $70,000. Additional information can be obtained from Tentime at 5375 Western Ave., Boulder, Colo. 80301.

'Reporter' Targets System/38

OAK BROOK, Ill. — Michaels, Ross & Cole, Ltd. has brought to market a report writer for use with the IBM System/38 CPF Release 5.0.

Called the Reporter Version 1.1, the software is intended to be used with the company's Query series and is said to give nontechnical managers access to System/38 information.

The self-documenting package is said to allow media-independent query capabilities.

The price for the report writer is $1,140, according to a spokesman. It is currently available from Michaels, Ross & Cole at Suite 501, 1302 W. 22nd St., Oak Brook, Ill. 60521.

General Ledger Package Supports IBM, HP CPUs

SUNNYVALE, Calif. — Data Design Associates has announced the General Ledger Financial Control System. The package is aimed principally at users of IBM mainframes and large-scale processors developed by Hewlett-Packard Co. However, the vendor said the package can be adapted to operate on most large mainframes.

The package uses English-language user commands.

The package includes an Automatic Interface Module which reportedly makes it easier to use the firm's Accounts Payable and Fixed Assets packages.

The package costs between $60,000 and $86,000, Data Design said from 1279 Oakmead Pkwy., Sunnyvale, Calif. 94086.

Measures Improvement Rate

Productivity Service Debuts

MCLEAN, Va. — Quantitative Software Management (QSM) has announced a new software productivity service that is designed to determine a software organization's development capability and provide the means to measure the rate of improvement over time.

QSM's technique is a combination of quantitative and qualitative information about a software project. Quantitative data provides the basis for objective tracking of productivity improvements. The qualitative data identifies the major productivity drivers.

QSM is able to quantify the benefits in terms of shorter schedules, dollars saved, manpower saved and return on investment in new tools and methodologies.

The price of the service is $1,000 per system analyzed. Discounts are available for more than 10 systems, the vendor said.

QSM is located at 1057 Waverley Way, McLean, Va. 22101.

Gateway Links Micro To IBM CPU

SANTA ANA, Calif. — Laguna Laboratories has brought out its first data gateway linking personal computers to mainframes.

Christened the Decisionlink/34, the gateway is a bidirectional interface between personal computers and IBM's System/34.

Made of a front-end controller and software, the new system includes a data base access module.

It also provides software that enables users of personal computers to query the mainframe and store results on a personal computer's disk.

Using one synchronous data link control communications channel, the controller can handle up to 16 personal computers linked to the mainframe via asynchronous modems or local cable connections, according to the vendor.

Price on an eight-port system is $8,500, available in November, from Laguna at 1300 Normandy Place, Santa Ana, Calif. 92705.

Package Ties Graphics Kit To Library

BOULDER, Colo. — Robertson Software, Inc. has introduced a software connector to fashion an interface between Precision Visuals' device-independent graphics package and the graphics utilities library of the National Center for Atmospheric Research (Ncar).

Named the Ncar Connector, the collection of portable Fortran 66 routines links the public-domain Ncar graphics utility routines for mapmaking, velocity vectors and streamline fields with low-level routines performed by Precision Visuals' DI-3000 package, according to a vendor spokesman.

It is now available for $1,000, from Robertson Software at 1001 Pine St., Boulder, Colo. 80302, or from Precision Visuals at 6260 Lookout Road, Boulder, Colo. 80301.

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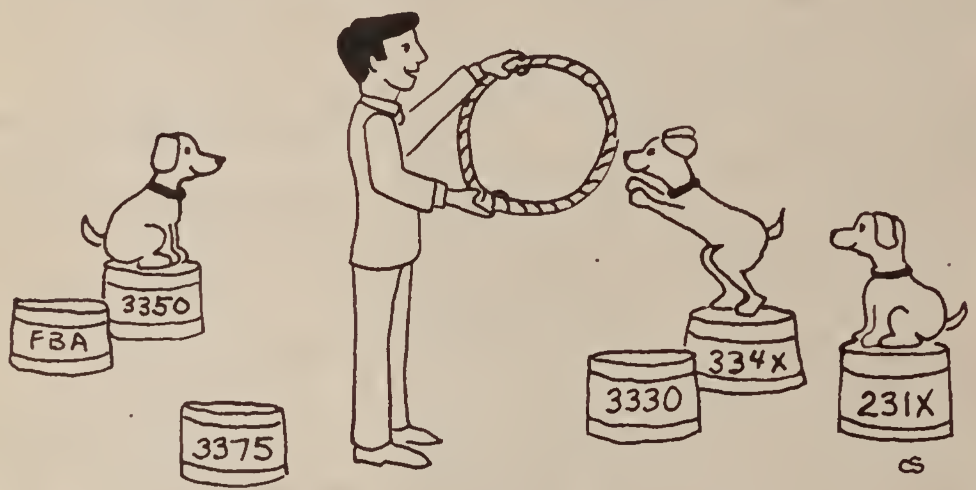

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CAD Drafting Systems Interface With IBM XT

NEW YORK — United Networking Systems, Inc. (UNS) has announced a family of two-dimensional computer-aided drafting (CAD) systems said to interface with the IBM Personal Computer XT.

Draft-Aide was developed by Safford Systems, Inc., and all rights have been acquired by UNS. The multidiscipline CAD software system is said to operate in production mode and features elaboration and magnification, data base manipulation/control function and component compatibility with the XT.

The line contains five products, all subsets of the Draft-Aide System 300, which is said to provide nearly 700 user capabilities for businesses that want to set up drafting service centers. It costs from $50,000 to $100,000. The five products are:

- PRO 300 — Designed for large corporate or engineering departments and sophisticated users, it sells for $25,000.
- PRO 200 — Designed for professional users, such as architecture or electronic firms, requiring a "full-power" drafting package, it costs $7,500.
- PRO 100 — A basic drafting package, it was designed for users with limited drafting requirements. It is priced at $595.
- Academic 100 — Designed for use by universities and trade, technical and company-sponsored schools for training novice and advanced users, it sells for $395.
- Starter 100 — An introductory service, it costs $95.

UNS is located at Suite 108, 7007 Gulf Freeway, Houston, Texas, 77087.

'P-Stat' Package Available for Use On Apollo Micro

PRINCETON, N.J. — P-Stat, a data management and statistical analysis package from P-Stat, Inc., is available for use on the Apollo Computer, Inc. Domain microcomputer.

The P-Stat package offers interactive data management, data display, statistical analysis and report writing capabilities.

Features for P-Stat include an on-line Help facility, interactive data entry, relational data base capabilities, macros and a range of statistical commands, according to a spokesman for the company. In addition, P-Stat provides for expandability through a user link facility, the spokesman noted.

Domain computers are 32-bit shared network processors that range from the monochromatic DN3000 and DN420 to the color DN6000 workstation.

Each processing node offers up to 3.5M bytes of main memory with multiple window display.

The license fee for P-Stat for a single Apollo Domain node is $2,000 for the first year and $1,000 for annual renewal. Annual and perpetual licenses for multiple nodes are also available, as well as corporate site licenses.

Additional information about the product, which will be available for the Domain micro in November, is available by contacting P-Stat through P.O. Box AH, Princeton, N.J. 08542.

Text Processor By Hemenway Fits Two Systems

BOSTON — Hemenway Corp. has announced the availability of a text processing package for use on Motorola Versados and Hemenway's MSP/68000 operating systems.

The text processor, Texpro, formats text for typewriter-like printers and terminals. It accepts lines of text interspersed with lines of format control information and produces the text formatted into a printable, paginated document.

Any already available text editor may be used to create the input text file to be processed by the text processor. Texpro can be used to produce a variety of documents, including manuals, form letters and contracts.

The price of Texpro is $500 per copy. The package includes Texpro text processor object code on an appropriate floppy diskette, user documentation and a one-year maintenance and support fee.

More information is available from Hemenway at 101 Tremont St., Boston, Mass. 02108.

Payroll/Personnel System Out

ROSELAND, N.J. — Automatic Data Processing, Inc. (ADP) has introduced a new payroll/personnel information processing system for companies with more than one site or 500 or more employees.

ADP's new service provides personnel analysis and reporting plus delivery of paychecks. According to the vendor, the data is entered directly into a terminal supplied by ADP, eliminating the need for hand-written input forms. The terminal is linked to a mainframe computer at ADP's regional computer center via an on-line, dial-up modem.

The system uses Digital Equipment Corp.'s VT 131 terminal and 120 bit/sec modem. Users can patch onto the on-line system 24 hours a day, seven days a week.

The payroll/personnel system consolidates all payroll and personnel data from a company's various locations into a centralized human resources data bank.

Additional information is available from ADP, 405 Rt. 3, Clifton, N.J. 07015.

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Micro Notes

Select Information Systems has announced that a French-language version of its **Select Word Processor** is now available for use with Digital Equipment Corp.'s Rainbow 100 microcomputers, with German, Spanish and Italian versions soon to follow. The software is base priced at $495 from the vendor at 919 Sir Francis Drake Blvd., Kentfield, Calif. 94904.

Pinnacle Software Systems has unveiled two additional versions of its **Superlist Manager** system for use on the IBM Personal Computer and the Kaypro II microcomputer from Non-Linear Systems, Inc. The software reportedly combines a structured data base management system with a word processor. It costs $249. The vendor can be reached through P.O. Box 1220, Fort Collins, Colo. 80522.

Xeno-Copy is a menu-driven software utility that reportedly allows 18 different microcomputers to transfer files directly disk-to-disk to IBM's PC-DOS format disks without any additional hardware or modems. The product is priced at $99.50 and is available from Vertex Systems at 7950 West 4th St., Los Angeles, Calif. 90048.

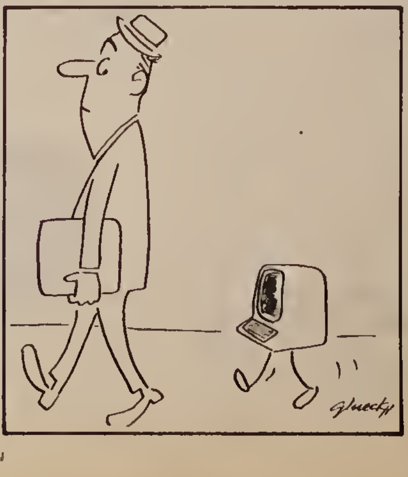
North American Business Systems, Inc. has released its latest version of **Memory/Shift,** which is said to give the IBM Personal Computer XT many of the capabilities of Apple Computer, Inc.'s Lisa microcomputer. It reportedly allows the Personal Computer XT user to have up to nine programs in memory at the same time and enables the machine to work with two monitors at the same time. It is priced at $99 from the vendor at 642 Office Parkway, St. Louis, Mo. 63141.

Advanced Systems, Inc. has announced the availability of its **Microtutor** interactive microcomputer diskette-based training courses to teach personal computing literacy and application skills on specific software. Microtutor courses include instruction on Ashton-Tate's Dbase-II, Visicorp's Visicalc and Lotus Development Corp.'s 1-2-3. Priced from $55 to $75, the courseware is available from the vendor at 2340 S. Arlington Heights Road, Arlington Heights, Ill. 60005.

Televideo Systems, Inc. has introduced **Telesolutions II,** a kit containing three software packages for use on the vendor's TS 803 and TS 1603 personal computers. The kit contains Telewrite for the first-time user, Telecalc for financial planning and business calculations and Telechart to allow users to display portions of the data in the spreadsheet graphically. Priced at $795 for the TS 803 and $595 for the TS 1603, the kit is available from the vendor at 1170 Morse Ave., Sunnyvale, Calif. 94086.

Lantech Systems, Inc. has released **Unetix,** a multitask operating system compatible with Unix. Stand-alone and networking versions of the package are available for 8086 or 8088-based micros, including IBM's Personal Computer. The stand-alone version includes a Microsoft, Inc. MS-DOS emulator. The first networking version is a distributed file system; a virtual file system for very large network installations is due by the end of the year. Unetix costs $99 from the vendor at 9635 Wendell Road, Dallas, Texas 75243.

Fischer Innis Systems Corp. has introduced **Watchdog,** a software system said to provide data security and system protection for microcomputers with hard disks. Designed for use on microcomputers running under Digital Research, Inc.'s CP/M operating system, Watchdog is priced at $295. More information is available from the vendor at 4175 Mercantile Ave., Naples, Fla. 33942.



Business Software Pty. Ltd. has announced **Profin,** a financial analysis package running under Digital Research, Inc. CP/M-80, MS-DOS, and IBM PC-DOS operating systems. Profin requires a minimum of 64K bytes of memory and a minimum disk size of 240K bytes. Priced at $295, Profin is available from the vendor at 1651 Third Ave., New York, N.Y. 10029.

Day One Software, Inc. has introduced **Day One,** a personal business software system for use on IBM's Personal Computer and Apple Computer, Inc.'s personal computers, among others. The software features multiple indexing, report generation, file scanning and search capability. Priced at $495 for the basic version and $695 for the advanced version, Day One is available from the vendor at 618 Shoemaker Road, King of Prussia, Pa. 19406.

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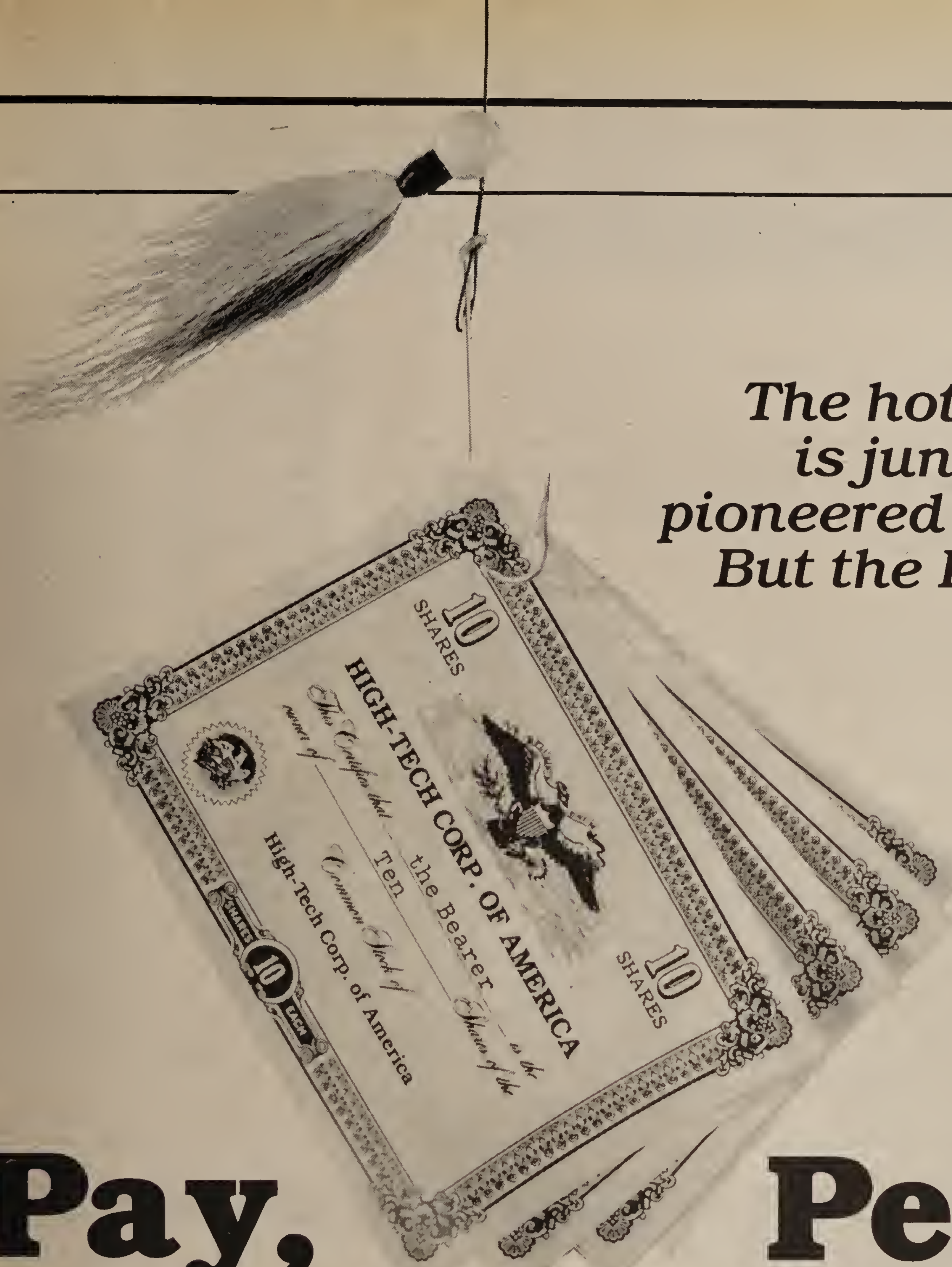
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Pay, Perks and Promises

By J.E. Richard and Michael F. Spratt

High-tech firms are creating compensation methods and reward systems almost as innovative as the products they manufacture.

The executive with an $80,000 annual salary may earn a long-term incentive (in the form of founder's stock or stock options) that could make him a millionaire in three to five years. The $120,000 executive in general industry would earn just a fraction of this fortune during the same period.

When Alan F. Shugart established Seagate Technology in Scotts Valley, Calif., in 1979, a handful of company founders bought six million shares for a fraction of a cent each. In 1981, the company went public with shares priced at $10 apiece.

Several factors distinguish the compensation policies of high-tech companies, including their relative size and stage of development. Contrast "threshold" companies with sales of no more than $1 million to industry giants with revenues counted in the billions.

Affiliation — whether the company is independent, part of a large established corporation or one unit of a conglomerate — affects all human resources policy, especially compensation. Location is another variable because local culture influences corporate culture and, thus, corporate compensation policy.

Organizations, whether large or small, often search the same market for technical, professional and managerial people. In a reviving economy, the increased need for key people surely will affect personnel and compensation practices.

Perhaps the best way of looking at compensation practices is to compare high-tech companies with each other and then with general industry. First, here's a look at the executive level.

Base salaries for executives in small ($2 million to $50 million) and mid-size ($50 million to $200 million) high-tech firms usually are significantly lower than salaries for the comparable position in general industry or even in larger high-tech companies. A $120,000-per-year position in general industry might pay as little as $80,000 in a small or medium high-tech operation.

Why, then, are these positions in high tech so attractive? The reason: primarily because the total compensation package is highly leveraged. The $80,000-per-year high-tech executive is likely to have annual bonus and long-term incentive arrangements that potentially may provide him with far greater rewards than the executive in general industry can ever hope for.

The compensation practices and tactics in start-up and threshold high-tech companies best illustrate this potential. Key executives, working for salaries well below what they might command in other more established industries, receive options to purchase so-called "founder's stock." The price often is only several dollars per share, sometimes even dipping below one dollar. If the company is successful when it goes public, the executive reaps considerable rewards. Perhaps the best-known example occurred several years ago when Apple Computer, Inc.'s first public offering created several dozen "instant millionaires."

Even without resorting to founder's stock, more established and smaller high-tech companies provide stock option incentives that will attract and retain key executive talent. These companies have this advantage over larger high-tech corporations and general industry both: Smaller firms can risk a deeper dilution of their equity by issuing stock options to executives. Some can dilute equity by up to 30%, compared with 8% or less for larger firms. These companies can take this step because of their potential for rapid growth and the confidence that the investment community shows in them.

> *'Smaller firms can risk a deeper dilution of their equity by issuing stock options to executives. Some can dilute equity by up to 30%, compared with 8% or less for larger firms.'*

Of course, there are risks — for the executive and the high-tech company alike. Any growth industry is more volatile than general industry — a variable known as a higher beta factor.

Usually, a small surge in the general economy will yield a larger growth rate in high tech. These industries, for instance, were growing at a 30% clip just before the 1981 recession. During the recent economic revival, technology stocks are among the leaders, with many far exceeding the average increases in the Dow Jones index.

But this "upside" potential is balanced by the inevitable converse scenario: A faltering economy generally will do greater damage to entrepreneurial efforts than to more firmly rooted industries. Between 1981 and the end of 1982, high-tech businesses suffered severely. Many companies in the semiconductor industry, for instance, were forced to cut back on production, lay off employees on all levels and in some cases even institute across-the-board pay cuts. Stock in National Semiconductor Corp. fell to about $14 per share as recently as a year ago. (In the upturn, it has traded as high as $60.)

So, for the executive seeking his fortune, high tech is not always a sure thing. (Witness the recent shutdown of Osborne Computer Corp., which just a year ago was selling 10,000 units a month.) But this uncertainty is the basis for executive compensation in this area. Growing a business in a competitive, quick-changing environment requires people who are risk-takers and entrepreneurially oriented. But the company gamble must be tied to their own personal risk.

Offering a large incentive in the form of founder's stock or other stock option arrangements accomplishes three objectives: It helps attract the right kind of person for a growing business; it links personal performance with the development of the company; and, by the nature of its payout schedule, it helps retain key people during the firm's early growth phases.

Retaining Executives

But even with the potentially lucrative compensation arrangements available to successful high-tech executives, many companies — particularly in the high-tech hotbed south of San Francisco — still are challenged to hold on to their top managers. Why? As the executives cash in on their options, there usually can be no repeat performance within their company. By this time, sales

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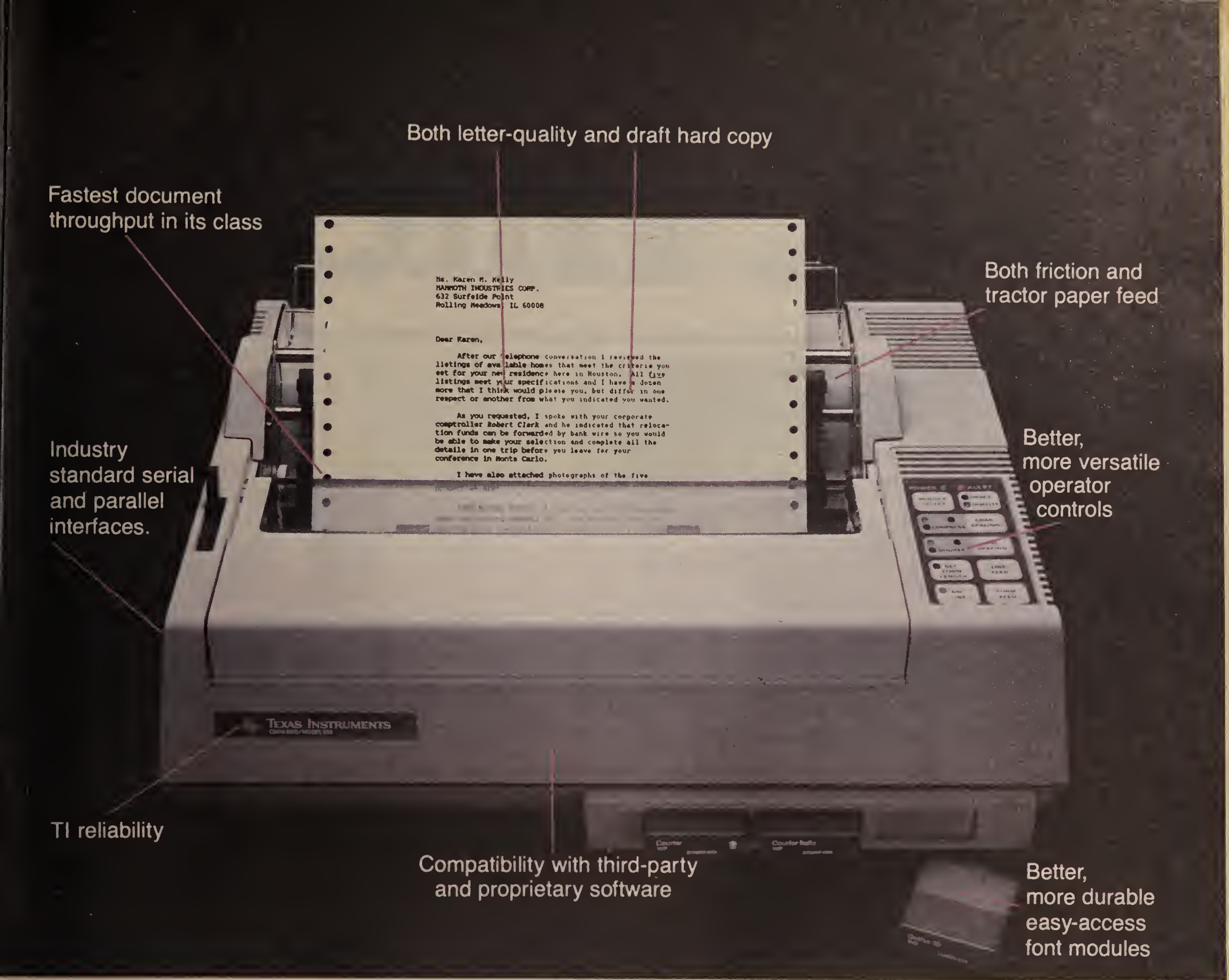
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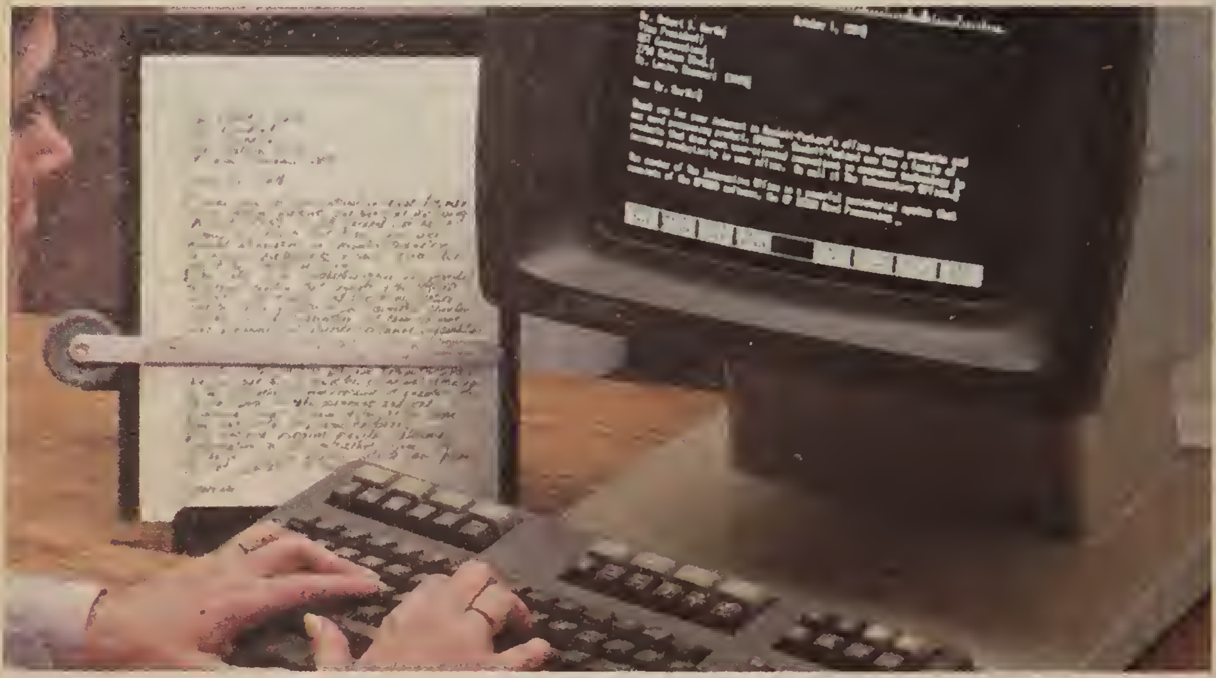

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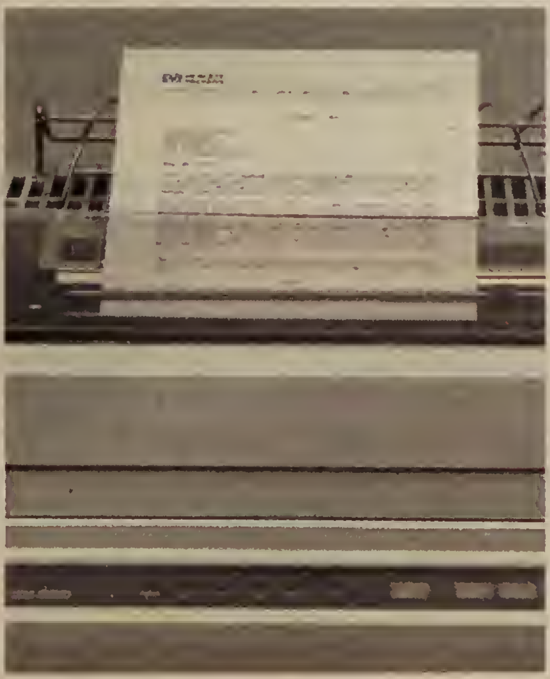

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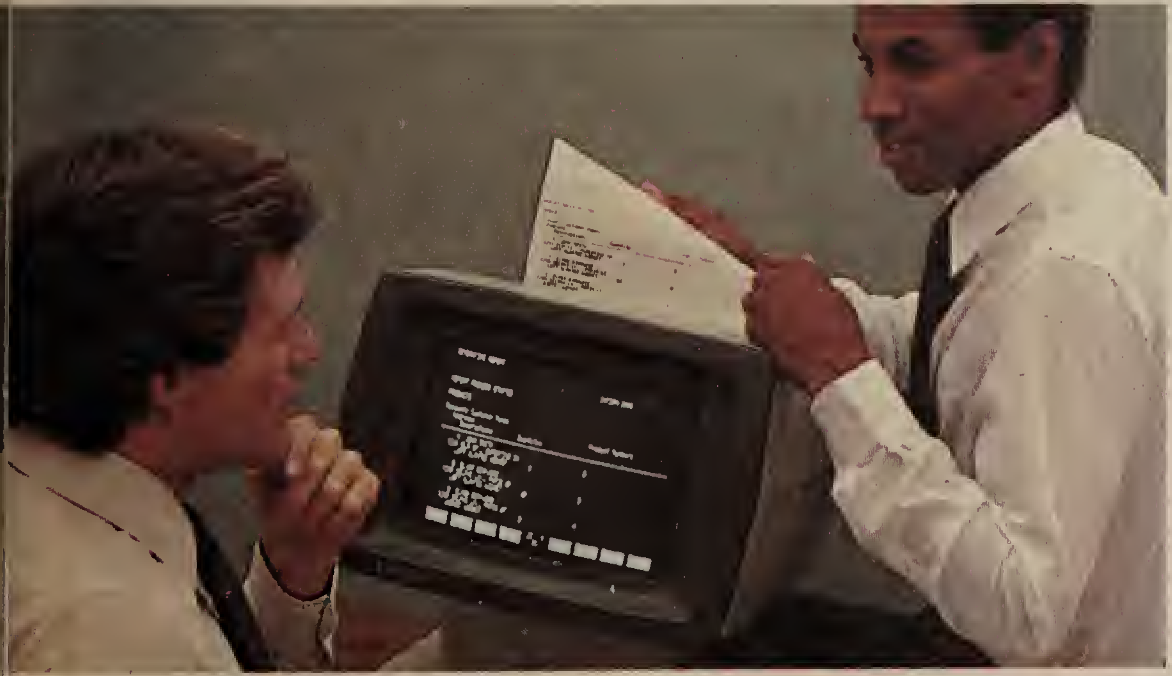

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probably are $50 million to $200 million or more. Further, continued high-level dilution of equity becomes inadvisable.

So, for those who thrived on risk and challenge, there is a great temptation to try it again. And many do just that, leaving to join new start-up companies. Then, too, there are those who joined a company too late for the first round of large-scale stock option distribution. They are ripe for picking by the emerging young high-tech firms that can offer them the potential for largess they just missed.

How, then, do more established high-tech companies and general industry manage to compete for executive talent? And how can they hold on to that talent once they have secured it? Several factors and practices are at work. First, not all competent executives thrive on the heavy risk and pressure that dominate the high-technology industries — particularly the threshold and small firms. So, there is a certain degree of self-selection that distributes this executive pool into appropriate positions. Still, there is the need for larger firms to assure themselves of some management continuity — to hold on to their best people. And other industries also must recognize the lure of high tech.

The venerable Pepsi-Cola Co. learned this lesson earlier in the year when Apple Computer wooed and won over that company's highly regarded president, John Sculley. Recently Atari hired away James Morgan, former executive vice-president at Philip Morris, Inc. High-tech industry now is reaching out for nontechnical executives with consumer products expertise.

Fighting Back

Larger high-tech firms and industry in general have been searching for ways to combat the aggressive compensation strategies of younger high-tech companies. One popular incentive is a restricted stock arrangement. Here the executives receive stock that is subject to various transfer restrictions until certain performance or time requirements are met.

But perhaps the hottest new incentive is "junior common" stock. Since it was pioneered four years ago by California's Genetech Corp., junior stock has been used by about 40 companies of all sizes. It appears to be an increasingly popular vehicle for high-tech subsidiaries of larger companies. Under this plan, companies issue executives junior shares of their stock at a lower price than their regular common — a $20 share might cost just $2, for instance — or grant it outright. Typically, junior stock provides no voting or liquidation rights, nor does it yield dividends.

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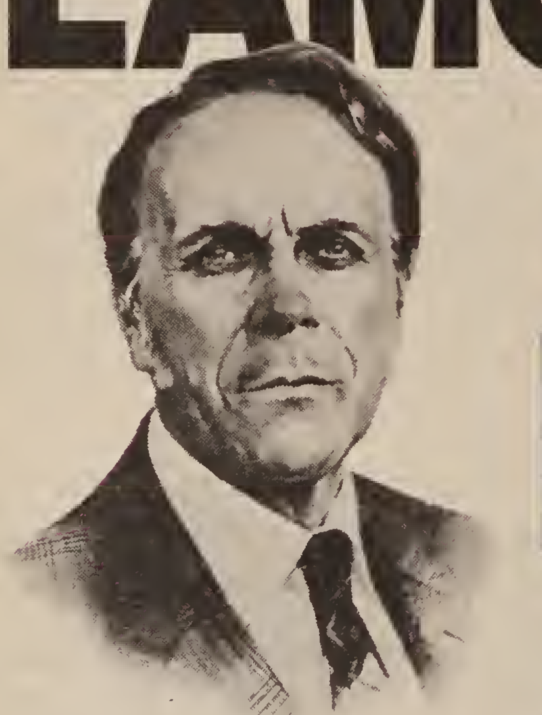
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years, when defined performance hurdles have been crossed, this stock converts into regular common shares. When the stock is sold, all gain is, theoretically, taxed at a lower long-term capital gains rate. The company incurs no compensation expense and actually generates a modest cash flow if the stock is purchased instead of granted. The executive gets a solid reward and a tax advantage.

The major downside risk to junior common is that the Internal Revenue Service and the tax courts have not yet ruled on it. The tax consequences and potential compensation expenses of junior common, therefore, are uncertain.

Different Picture

The compensation picture for middle managers and professionals in technology industries is very different from the one for those on the executive levels. Here, extensive leveraging is impractical. (In start-up companies, however, where there may be only one or two engineers at the outset, it is common for these people to get "a piece of the action.")

Salaries, therefore, even in the smaller companies, are usually above general industry averages — in response both to the demand for qualified people and the premium that many high-tech companies situated in high cost-of-living areas (San Francisco and the Peninsula area, Boston and so on) must pay.

At the middle-management level, high-tech companies generally pay at the 60th to 75th percentile of the all-U.S. average. Our own surveys show that electronics engineers, at the technical center of most high-technology enterprises, are paid above all-engineer averages — at least 5% more at the managerial level.

But compensation for middle managers and professionals in high-technology companies differs in other ways. The pattern of supplemental income for these employees is distinct from larger industry. These differences are deliberate — a way for these companies to attract the kinds of people they need.

A Share of the Company

Results of our recent survey of 21 of the larger high-tech companies in the U.S. ($300 million or more in revenues) clearly indicated that the compensation programs within these companies were driven by a desire to maintain a more egalitarian culture. To foster a "team approach," these companies emphasized sharing in company growth. For instance, profit-sharing programs are quite prevalent. Almost half of the companies in the survey had some kind of profit-sharing plan. On the other hand, a Hay/Huggins survey of more than 800 companies in a cross-section of large U.S. industry and business showed that only about one in five companies used this reward device.

In smaller companies, this share-the-wealth philosophy can be extended even further. Cullinet Software, Inc. of Massachusetts, for example, reportedly makes stock options available to its full work force of 800.

Another way that some high-tech companies promote a less hierarchical culture is by eliminating some so-called executive "perks" or by extending them and other compensation vehicles down to broader levels of employees. For instance, while long-term incentives such as restricted stock or stock grant bonuses usually are reserved for officers in large industrial companies, the high-tech companies that use these vehicles offer them to key contributors.

At the same time, the executive perquisites that distinguish between the executive caste and others in the company are less noticeable in high tech. Only one perk — physical examinations — is present in more than half (67%) of the high-tech companies surveyed.

There are special vacation policies for executives in only 14% of the high-tech survey vs. a 40% prevalence in the Hay/Huggins survey. Again, only 14% of the high-tech sample provide loans to executives, compared with 47% in general industry and business. Supplemental retirement plans also were less prevalent — 24% as opposed to 59%.

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In medium and smaller high-tech companies, the distinction between executives and other employees probably blurs even more. There, systems of special perquisites are either very limited or nonexistent.

Key Contributor Programs

On the technical level, many companies face this compensation dilemma: Although technical professionals supply much of the energy and innovation necessary for success, they are rarely eligible for the incentives available in executive compensation programs. How, then, can companies attract, retain and motivate their technical professional corps?

As mentioned earlier, above-average salary is one way. But this feature has its upper limits before it creates problems of "salary compression" — a subordinate's salary too closely approaches that of his superior. Many high-tech firms resort to the so-called "front-end bonus," a bounty of several thousand dollars just for signing on. (About one-quarter of the high-tech firms in our survey indicated that they used this device, compared with only 5% in general industry.)

But the front-end bonus — very popular for geologists and petroleum engineers when oil companies were prospering several years ago — is a short-term compensation vehicle. It actually encourages job hopping rather than employee retention and performance. A better program that high-tech companies are adopting gives a variety of awards to key contributors.

Special compensation practices to reward key contributors and contributions range from recognition awards (from plaques on up to large cash awards) to royalty arrangements for developing a new product. Computer and computer game software is one example of this. One large company reportedly provided personal computers to its employees, with this vast labor pool subsequently developing much of the needed software at a total cost far less than that of funding a research and development team.

But with few exceptions, most key contributor plans are not really plans at all. They are informal, fragmented and inconsistent in their application. Often they are reactive (responding to accomplishments) rather than proactive (encouraging them).

Approach-Avoidance

So while the principle of key contribution seems sound, there is concern over its potential to be counterproductive. As one executive recently remarked, "We reward the few and offend the many." This has resulted in a "approach-avoidance" conflict: Some companies have attempted to develop key contributor programs, only to back off when confronted with the possibility of negative effects and/or administrative difficulties.

Still, even though they may be difficult to develop and administer, soundly built and well-communicated key contributor programs can be effective — even essential. In the high-tech industry, where executives can become instant millionaires and income at the top level is almost open-ended, it is important for the "little guy" to operate in an environment where his special effort can yield some special reward.

Compensation practices, especially in technology industries, will not be stagnant. As companies grow and change, as new tax laws and rulings emerge and as executives and professionals manifest new personal aspirations, reward systems will adjust accordingly. The companies that will retain a competitive edge in the human resources marketplace will not necessarily be those who pay the most. Rather, the winners in the search for talent will be those who pay the best — pay the best people in a way that best suits both the strategic direction of the company and the individual needs of employees on all levels.

About the Authors

J.E. Richard and Michael F. Spratt are senior consultants in the San Francisco office of Hay Management Consultants. Richard specializes in developing compensation programs for executives. Spratt directs Hay consulting activities for high-technology firms.

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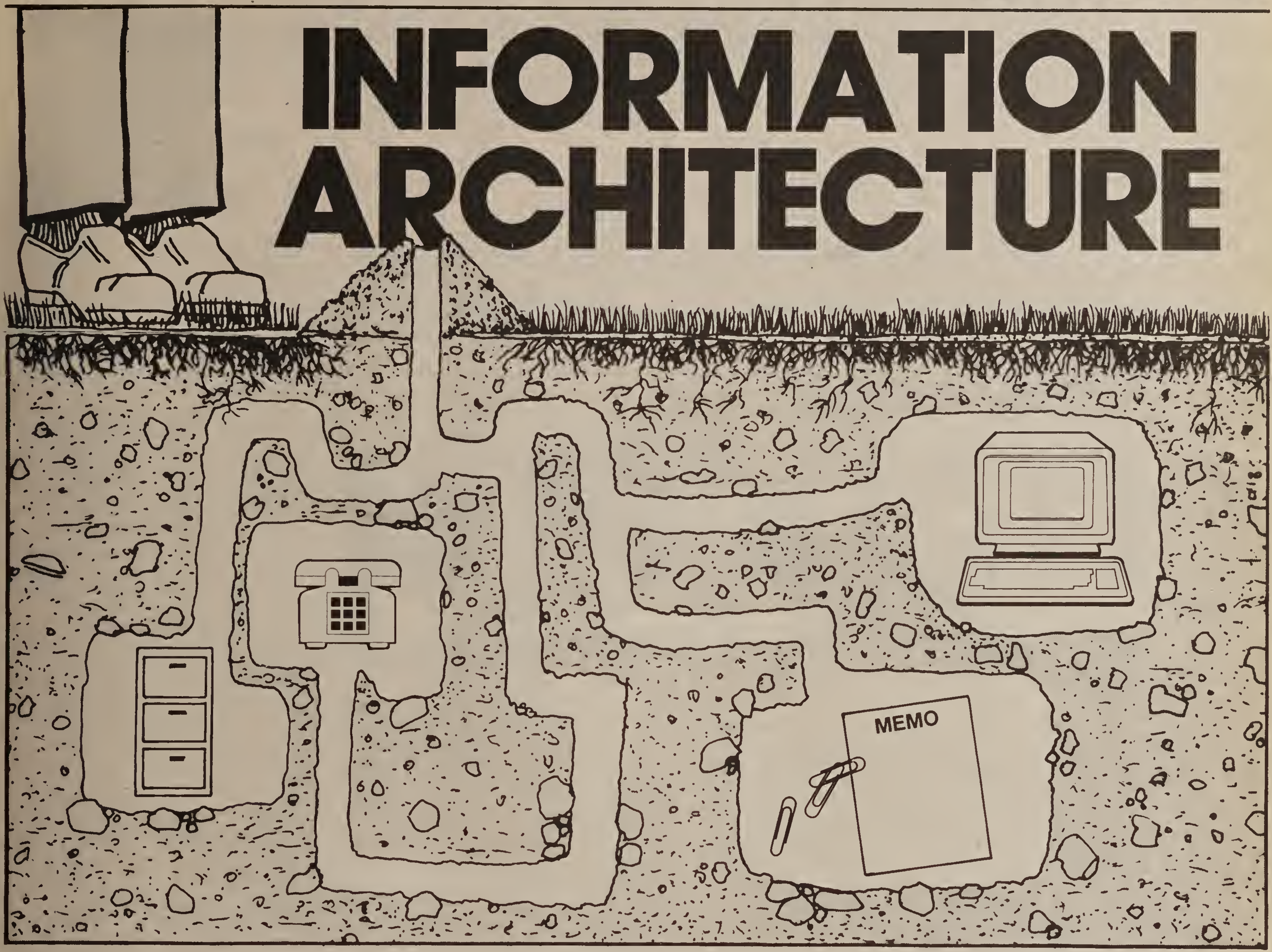

By Edward Roche

To optimize information management on an enterprisewide basis, MIS can use information architecture — a global depiction of information flow supporting the organization's essential functions. Implementing this information structure requires a two- to five-year perspective.

For the systems development manager, information architecture uses conceptual tools to depict the underlying structure of corporate information flow in a manner intelligible to management. These tools provide a lens to focus on areas where systems development resources can be applied most usefully.

The concept of information architecture and how it may aid productivity is guided by an integrated business overview of the entire firm and its goals. Without such an agreed-upon overview, the organization cannot rationally apply technology to meet basic business needs.

A key decision facing top management of any corporation is how to find areas for investing capital within the corporation that have the highest potential for increasing total corporate productivity. Especially in the industrial sector, which is heavily capital intensive in machinery and physical stock, white-collar occupations are commonly managed as overhead items. Under these circumstances, major capital allocation decisions take place within the context of improving the physical plant. The white-collar section of the "plant" is ignored.

But this is not to say that no capital flows into the white-collar area. Instead, we occasionally find that white-collar expenditures and overhead are shooting upward at a rate exceeding available capital investment in crucial sectors of the corporation. The problem lies in the uncoordinated criteria governing capital allocation.

In the case of plant investment, highly rationalized methodologies are employed for finding the optimum path. However, in the white-collar area, the discretion and standards employed are far less stringent. Since white-collar productivity is thought to be a vague concept (because it is more difficult to measure than blue-collar machine productivity), the stringent rationalizations applied to other areas are usually avoided.

At the same time the white-collar work force is undercapitalized, the information it is handling, manipulating and making day-to-day operational decisions upon is not being managed systematically and rationally. The cost of information — its creation, storage, manipulation and distribution — is impossible to account for in most firms.

Furthermore, various units within firms frequently use different forms of information when the substance is essentially the same. Various information "pools" are located in diverse sections of the organization and growing rapidly, thanks to the expanding power of newer information technologies — first the photocopy machine, later the word processor.

In order for one division or section of a company to communicate with another, information frequently has to be translated into forms, symbols and languages compatible with the recipient organization. The number of clerical jobs with this process of simple translation as their sole function has multiplied. Letters are changed into memos, memos are changed into letters, forms are changed into machine information, ordering information is translated into accounting information, inventory information is translated into sales and marketing information and so on throughout the firm.

As information is transferred throughout the business enterprise, accounting has little control over costs of discrete informational items or over discrete information processes.

With the spread of office automation and management information systems, accounting has improved — but only for machine-held information. Remaining outside the comprehension of standard accounting systems is that vast amount of documentation and bureaucratic process that takes place on paper. In contrast to the MIS department, this vast world of information stores, information processes and information flows is uncharted territory.

Its size is essentially unknown. Systematic rationalizations of its processes are difficult, and results of improvements are impossible to determine. In this world, costs are measured in terms so vague as to raise questions about reasons for measurement in the first place.

Firms are beginning to recognize that information technology can be a strategic weapon in a competitive environment. A fast-moving, transparent, flexible and reactive information system can go far in making those marginal differences in service, price and response time to customers that are necessary to gain market share or retain clients.

Companies such as American Hospital Supply have realized strategic improvements by placing order entry terminals in the offices of customers. And the new Citibank bank-from-home system is clearly an attempt to use the same strategy. Warren McFarlan has frequently argued that the most recent collapse of Braniff Airlines was due in part to its inability to control airline reservation systems.

Need for Comprehensive Model

The drive for improved reaction times of various company units and the increasing need for translation of information coming from other information pools in the firm have resulted in a natural desire that data elements, in either a paper- or machine-readable mode, be made consistent.

Individual decision-making units within an organization, at any level, should be able to receive information or reports concerning other distinct sections of the firm without having to rely on the personnel of those other units to produce the information required. If such a horizontal and vertical reporting structure is to be possible, then the walls separating different information units must be destroyed.

Although in many cases the information barriers, both horizontal and vertical, between different sections of the firm have become more transparent because of demand and frequency of use, this situation has seldom developed according to a well-thought-out plan. Such a plan would ensure that breaking down barriers would not result in creating new ones. It would also ensure a rational prioritization in allocating scarce human and capital resources. It should ensure that the sections of information flow given priority treatment are those that all agree are essential to the effective operation of the firm.

Finally, the plan must ensure that the criteria used for rationalization of information channels and structures within the organization conform directly with the corporation's long-term overall strategic plan, since rational information manage-

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Toll Free 1-800-433 7632, 433 7633 In Texas (817) 281 9450 ment is not a self-contained process independent of the business mission.

Incremental Changes

Information architecture is not being fueled by the realization that information itself, including the way it is processed, its range of application and its timeliness, is the firm's key asset. It is not being fueled by the realization that some overall plan for all information within a firm must be put into place. Nor is it driven by any overarching vision of the corporation as an "information machine."

These holistic and comprehensive approaches to information technology and management are not behind the transition to information architecture. Instead, the concept is driven by a series of incremental changes in the scope of information technology utilization within the firm. Various complexes of intensive information technology utilization are forming at increasingly lower levels, and both employees and managers are recognizing that these information complexes must communicate across departmental boundaries and geographical distances.

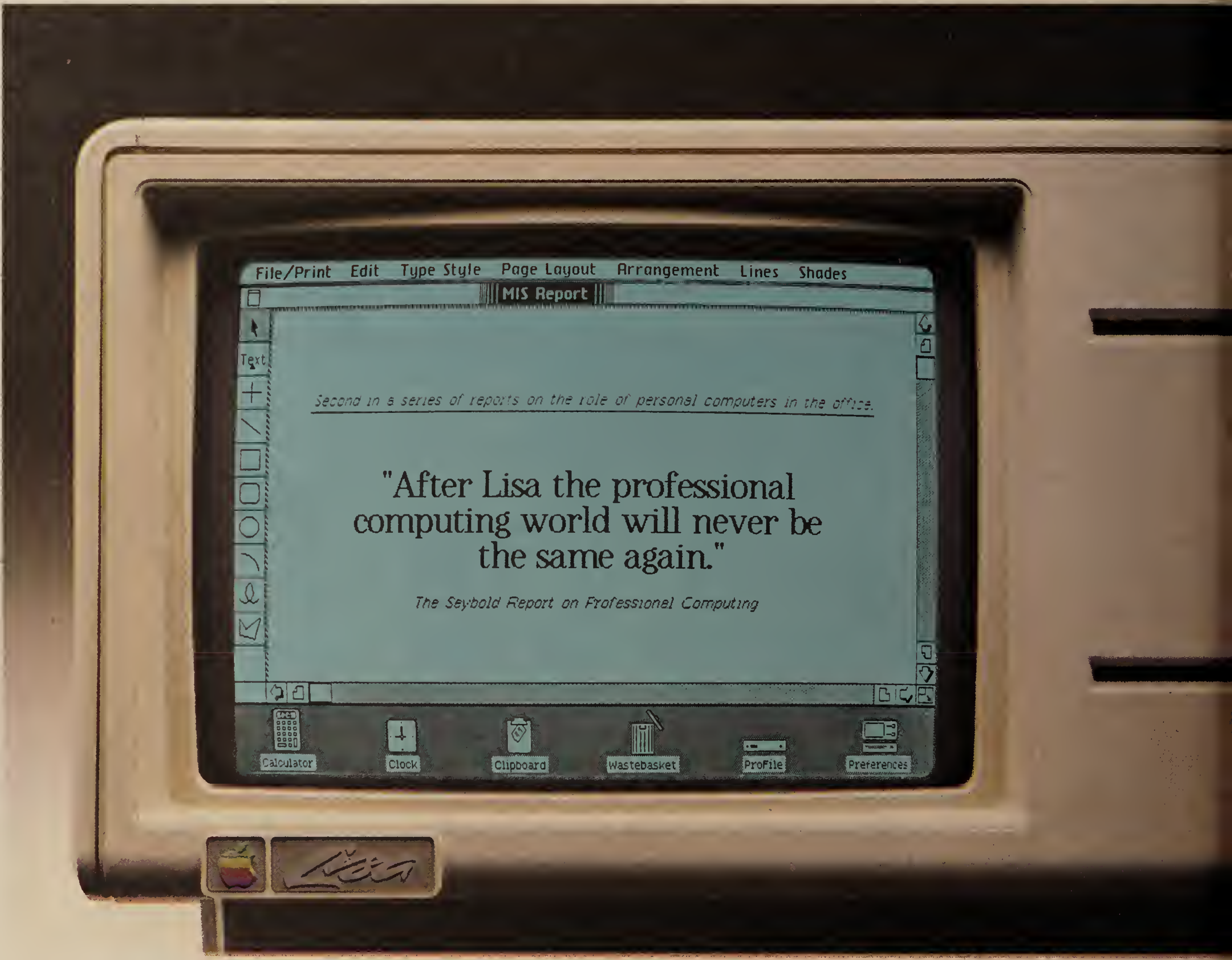
Older designs of MIS systems inevitably depended on a "paper nexus" — a boundary somewhere between the information *machine* and the broader corporatewide information *system*. Thus, an automated parts inventory subsystem, for example, would "talk" to the accounting department subsystem via paper-based intermediation. This paper nexus is being increasingly absorbed by direct hookup of previously unconnected information subsystems.

Piece by piece and link by link, these networks are being built on the foundations of paper-based systems. This information restructuring is a response to the need of information subsystems to maintain the same forms of communication with other parts of the firm as had existed under paper-based conditions.

Information architecture argues that such linkages should be made part of an overall plan. Furthermore, as automation of paper-based reporting relationships and their associated job functions takes place, a window of opportunity opens briefly to the possibility of restructuring not only information definition, but job functions as well.

Although present in all sectors, this trend is most visible in the publishing industry in such newspapers as *The Financial Times* of London, which recently suffered a prolonged strike in part over a proposal to let reporters file their stories directly into an electronic system. The recent strike against AT&T by the Communication Workers of America also in part concerned the perception of possible "deskilling" of service personnel.

The negotiations in 1979 between the Ford Motor Co. and the United Auto Workers union established a National Committee on Technology Progress to ensure workers were "upskilled" to automated processes. These examples point to the risks



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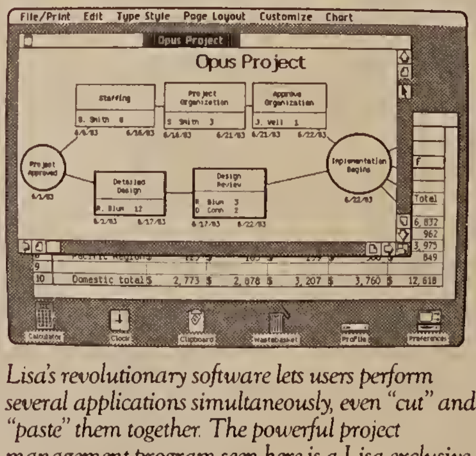


Lisa's revolutionary software lets users perform several applications simultaneously, even "cut" and "paste" them together. The powerful project management program seen here is a Lisa exclusive.

approach to software and 200 person-years of development.

Lisa replaces complex computer commands with symbols familiar to anyone who's ever worked at a desk.

Even someone who's never touched a computer before can learn Lisa in under half an hour. Versus the 20 hours or more required to unriddle conventional PCs.

To information managers, that means dramatically reduced training time and increased productivity.

But people don't just learn faster on Lisa, they also work faster. Each of Lisa's powerful applications* use symbols and commands common to all. So with little practice, users can move from LisaCalc to LisaGraph to LisaWrite without missing a beat. Or use them all at once, "cutting" information from one program and "pasting" it directly into another.

and opportunities inherent in aggressive automation efforts.

Information Machine

As efforts are made to transform the paper-based substructure of the corporation to a computer-mediated superstructure, communication between various sections of the firm must take place. This communication must define those linkages that both lend themselves best to computerization and conform with priorities of interdepartmental relationships. As automation of linkages takes place, definitions must be worked out regarding individual communication streams, locations of data bases and sharing of costs for automatization. These definitions, in their final form, encompass the individual data elements.

With huge numbers of data elements in the firm and many interrelationships between fields of data at varying locations under the paper-based system, it is simply a matter of practicality that no comprehensive systematization can be created without a global, corporatewide view that relates all major business functions to their constituent informational components.

The information architecture management approach views the entire organization in terms of its informational superstructure. It also recognizes that as automation of the paper-based substructure takes place, large quantities of information will become redundant. The basic utility of the information architecture approach lies in its ability to consolidate the information and communications functions of the organization in accordance with structural rules derived not from cost/benefit analysis of single applications but rather from the functional principles of the business mission.

Charting Information Flows

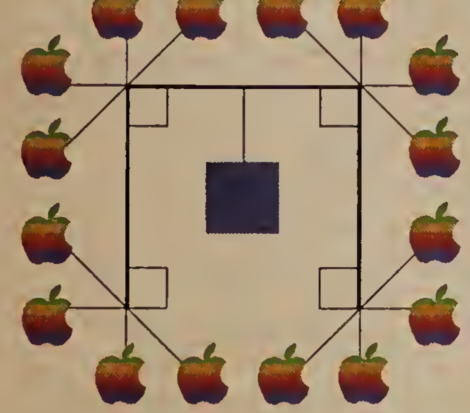
Since the entire organization can be defined in terms of its information flows, the task of mapping the detailed informational structure can best be accomplished by starting with a macro-level simplified analysis of the aggregate flows of information and connection between large units of the organization. In the simplest form, the corporation takes in information from the outside environment and converts it to control signals that regulate the processing of raw materials into products.

The simplified model leads to further breakdowns of the ctegories of information coming into the firm. These include marketing information, intelligence on other companies, government regulations, prices of raw materials, labor demands, orders for products, announcements of new products and many other types of information. Within the firm also are myriad channels of communication and many different "families" of information: personnel records, payroll and accounting, the legal department, inventory management, internal pricing and chargeback.

As raw materials are processed into the final product,

There's even a program — LisaProject — that lets you use the mouse to chart the progress of complex projects, automatically recalculating when deadlines or resources change.

On paper, Lisa is just as exceptional. With its dot matrix and daisy wheel printers, it produces printed materials just as you see them on the screen.



AppleNet, available soon, will let Lisas and other Apples share information, and costly peripherals.

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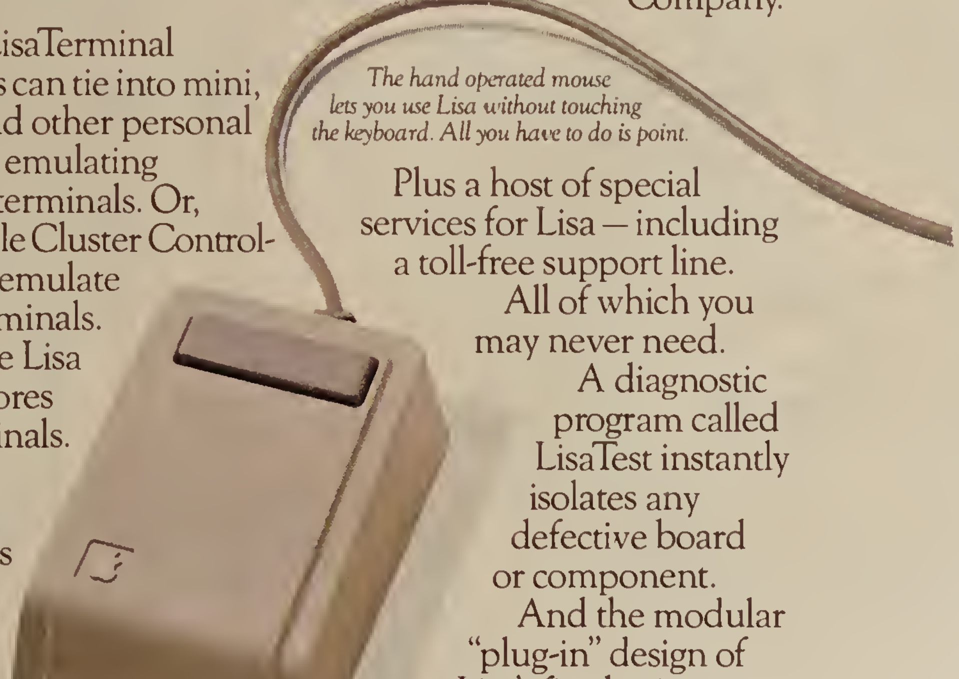

The hand operated mouse lets you use Lisa without touching the keyboard. All you have to do is point.

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a large but finite number of repeated information flows takes place. Although at first these may appear chaotic, analysis can identify underlying patterns of interaction between different informational units of the firm. As these underlying relationships are discovered, the macro-level generalized representation of the firm is broken down into successively more detailed and refined maps.

At an even more refined level, each communication pattern and channel is broken down into each of the types of information it transmits. These general types of information are then broken down to the individual data element level.

At this point, an entire information map of the firm is completed. It is as detailed as a blueprint for a building and may be called an information architecture. Each level of analysis, from the individual data element level up to the departmentwide or division level, is comprehensible to corresponding levels of management in terms of the other sections of the organization.

Functional Specifications

Once these informational flows and relationships have been identified and mapped, it is possible to trace how far into an organization a particular bit of initially external information goes. Some types of information are absorbed into the organization and quickly digested. Other types of information might be passed along throughout the organization to different levels or divisions. Some types might be combined with information available only from inside the firm and then passed along further.

By tracing the paths of information flow throughout the different functional centers of the organization, it is possible to identify information flows by function. This process helps even further in prioritization tasks.

Ultimately, it has been determined that the patterns of information flow are by no means random. Information flows correspond roughly to hierarchical relationships within the organization. Information flows and functions associated with certain tasks are also identifiable. Since the organization's general business plan goes far in determining priorities for specific business functions, it should be possible, after having completed the above steps, to define needed changes in information relationships.

This can be done by analyzing the capabilities, speed, volume and capacity of the various functionally related communications channels. For information storage and retrieval, frequency of access and other factors should help in deciding the relative importance of each particular information pool or information channel to the function being supported. Obviously, for example, information flows supporting high-priority functions should not suffer barriers.

External Interfaces

Another problem being recognized by practitioners of information architecture involves the relationship between those "information accounting systems" pertaining to internally held information and those pertaining to external information.

One must recognize from the start that paying a great deal of attention to the channeling and handling of information within a firm will be ineffective in the end if the structure and volume of information flowing to and from the outside are not also taken into consideration. And the internal department structure should be designed to reflect the types of information relationships it must maintain outside its environment, either within the firm or external.

Without careful information architecture, there may be a tendency to design the operations of a given unit with a view to maximizing its internal efficiency and to design the external interfaces as an afterthought. When each unit is designed to be internally efficient, it might erroneously be thought that the "sum of the parts" — the whole organization — should also be working at maximum efficiency. This line of reasoning ignores the internal communication that must take place within the organization.

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in information architecture where the firm and its relationships with the business environment are considered, it is wrong to base designs of internal information and communications systems solely on criteria of firmwide efficiency.

Information architecture suggests that from its initial phases, any project to revamp an internal information and communication structure should give the external gateways and interfaces a weight proportional to their relationship to the overall strategic business plan. This rule is applied at the unit level as well.

Weberian Transformation

The commonplace paradigm in organizational theory used to describe the firm revolves around basic concepts best formulated by Max Weber. The Weberian concept of bureaucracy, and thus of business organization, is rooted in a pyramid-like hierarchical formulation of control in which general commands are given at the top and transformed into concrete discrete steps by an army of trained specialists at each lower step of the organization. Generally speaking, command information travels downward through the hierarchical organization, whereas reporting information necessary for intelligent control functions travels upward.

Under this system, the levels at the top of the pyramid frequently become overwhelmed with information. Although the velocity of information within the organization might increase dramatically, information overload can inhibit control function response time, thus harming the organization.

Occasionally, for efficiency, the higher levels of the organization are circumvented through informal communication networks. Rather than continue waiting for delayed responses from higher levels within the organization, individual units communicate with one another and make independent judgments about the most probable trajectory of a decision, based on previous experience.

As the information overload within an organization increases, these informal networks become more important because higher levels of the organization cease to exercise effective control and monitoring.

Information architecture recognizes that, at some point, these informal lateral networks are more important than the formal hierarchical system, traditionally measured in terms of span of control.

Generally, the reduction in effective span of control caused by increasing hierarchically flowing volumes of information can be mitigated to some extent by:

- Increasing velocity of information.
- Increasing selectivity of control information.
- Vertically delegating control functions.
- Increasing number of decision makers at the top levels of the hierarchy.
- Increasing number of effective control decisions.
- Reducing amount of information required to make the same operational decisions.

> *'If products are expected to change in response to a cycle, it is natural to expect entire industrial sectors to do the same. Such an adjustment is impossible if the information systems — the nervous system of the organization — are hardened into a rigid structure.'*

However, these traditional techniques for handling information overload ignore the potential of the informal networks that are inevitably built up within the organization.

Information architecture would solve the span-of-control problem by first focusing analysis upon the functionally determined control networks operating within the firm. In contrast, traditional analysis would make remedial changes based on

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hierarchically determined control networks. Thus in the old paradigm, much effort might well be focused on packing more and more decision support capability at the higher levels of an organization, whereas an information architecture analysis might recognize that control can remain decentralized.

Surge Capacity

Using information architecture, priorities for allocating information technology are based not solely on the level of perceived internal demand, but rather on the relationship between that demand and priorities identified in the business plan. Of course, those sections of the organization that have experienced overloading during peak periods and that are crucial to the conduct of business in a short-term environment would be designed to accommodate any surge in business activity.

The integration of this capability into the design of a firm's information flows is particularly crucial in high-transaction, high-velocity business sectors. Seasonal or market-induced changes in demand can be large enough to harm the organization's competitive position if it should fail to meet the unexpected demand surge.

One indication of fundamental change in the infrastructure of industrial society is the shortening of the product cycle. Economic policy has also had an effect upon the MIS environment insofar as capital available for investment has become more scarce. Increasingly, the argument is heard that just as separate products are subject to a product cycle, so too are entire industries. Analogously, if products are expected to change in response to a cycle, it is natural to expect entire industrial sectors to do the same. Such an adjustment is impossible if the information systems — the nervous system of the organization — are hardened into a rigid structure.

While virtually any information and communication system can be changed in response to industrial restructuring, a key question obviously is, "How much does it cost?" Information architecture would ask, "To what degree has the information system been designed to change its structure quickly — and inexpensively?"

To a certain extent, some of the same concerns that arise in designing a system for expansion also occur when designing a system for change — for example, modularity of peripheral and subsystem interconnection, transportability of hardware, ability to add on major computer interfaces. However, information architecture would recognize that the base of information structural change is the actual business requirements and corporate information flows, not the hardware systems that have been installed.

Organizational Benefits

Adopting a comprehensive information architecture approach will result in several tangible benefits to the organization.

1. *Achieve Political Consensus.*

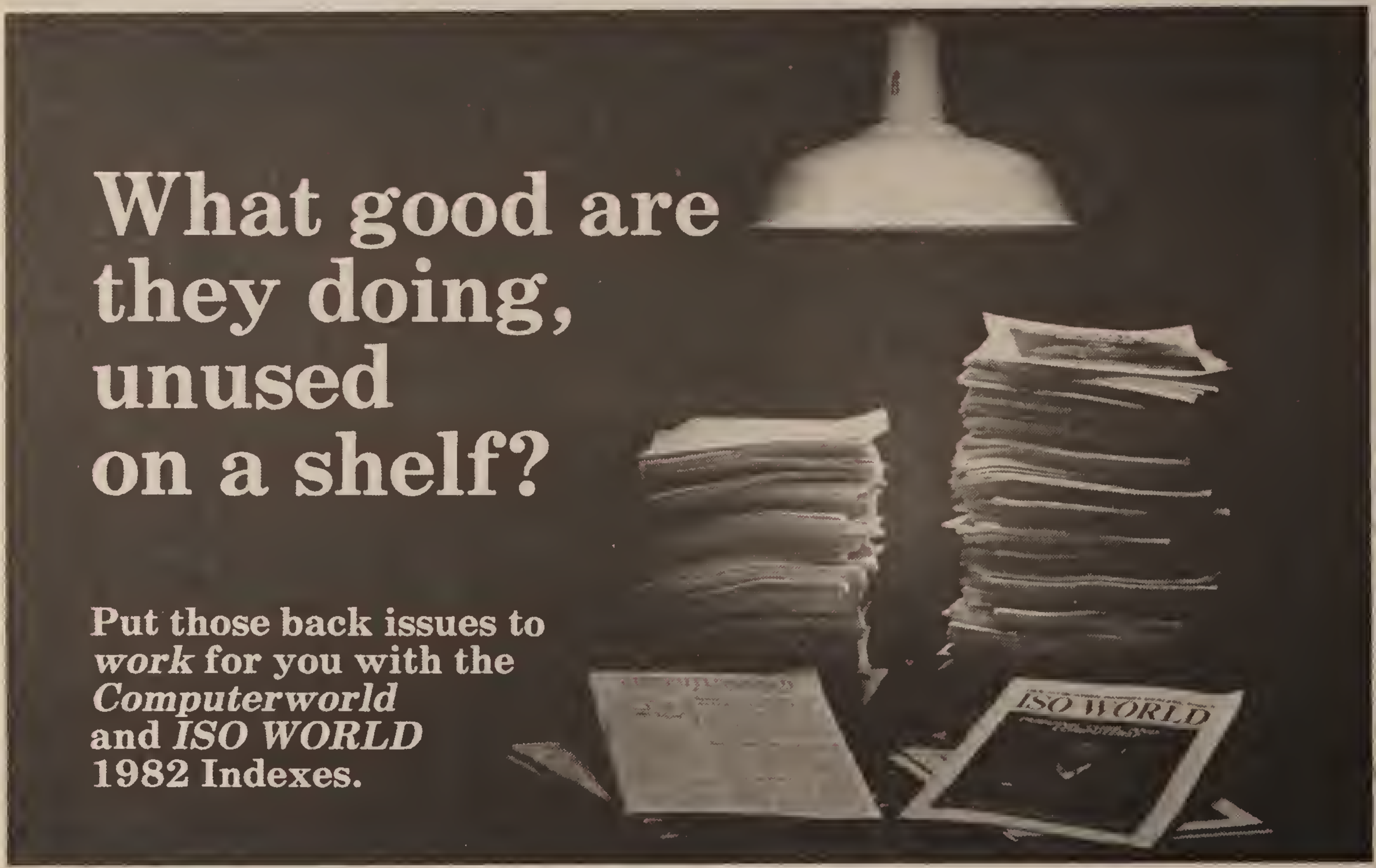
Information architecture may begin both to address and to diminish the problems of perception that are straining relations between users, management and MIS. It does this by helping to communicate clearly how information processing and flows relate directly to specific business needs and activities.

Although a key barrier to the effective use of information architecture is politics, significant technical problems must be solved as well. The demonstration of tangible benefits that may accrue leads to a powerful political strategy for implementation.

When there is disagreement on the issues, political considerations tend to win out. Information architecture helps eliminate conflicting beliefs by promoting a common view of the business.

2. *Speed and Service With Higher Revenues.*

The quickening of information velocity throughout the firm directly increases the productive capacity of each employee and business unit. Decisions are improved and customers get better service. Information technology, therefore, can become a key factor in the firm's strategic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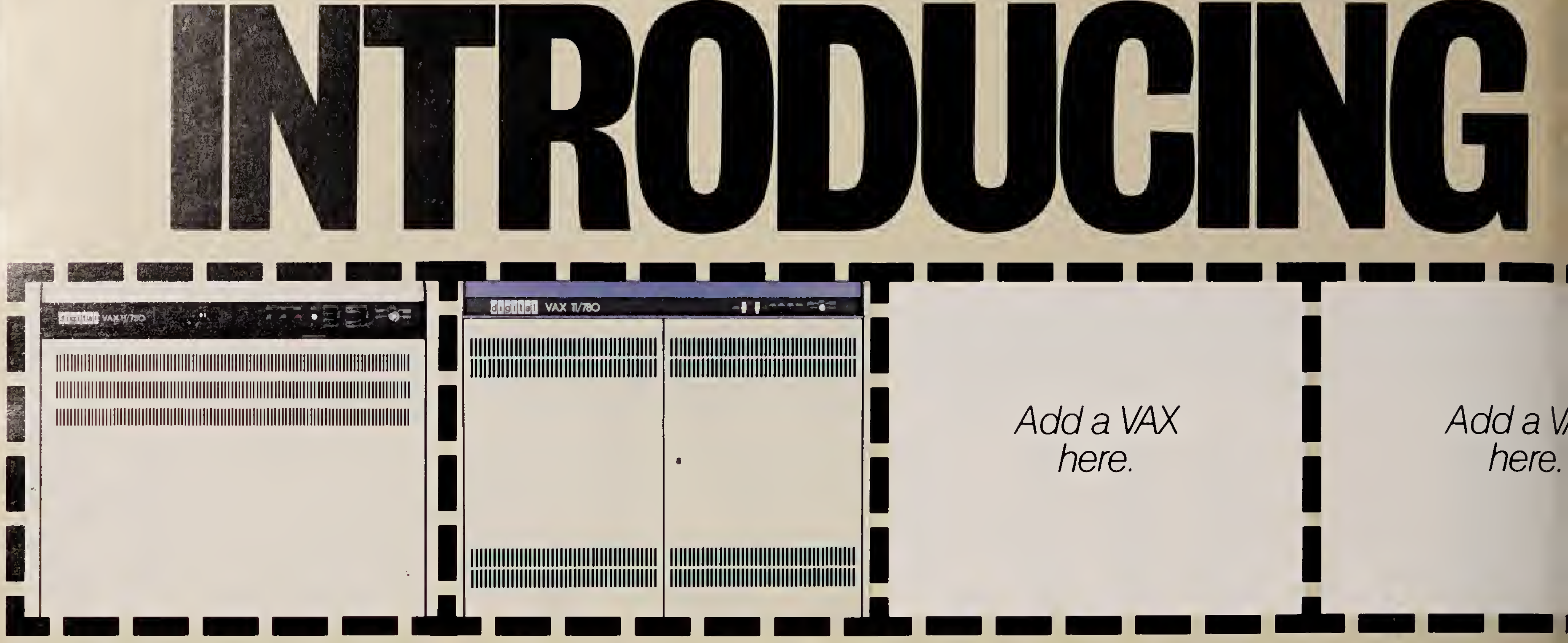

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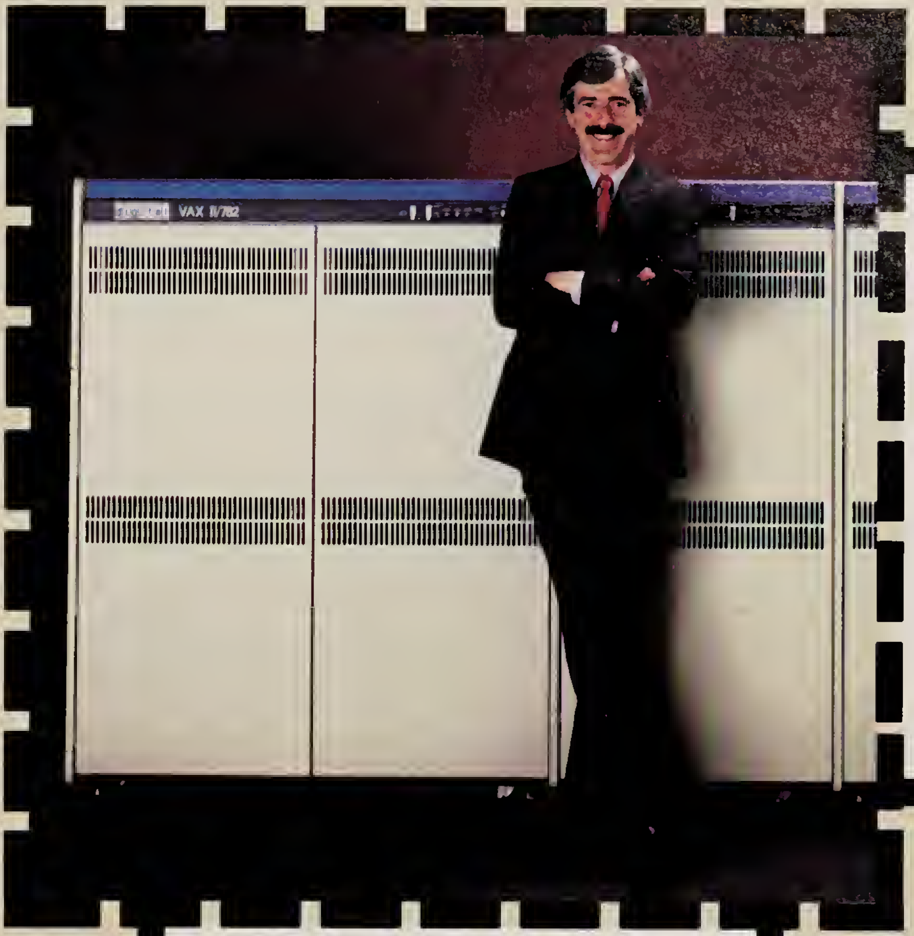

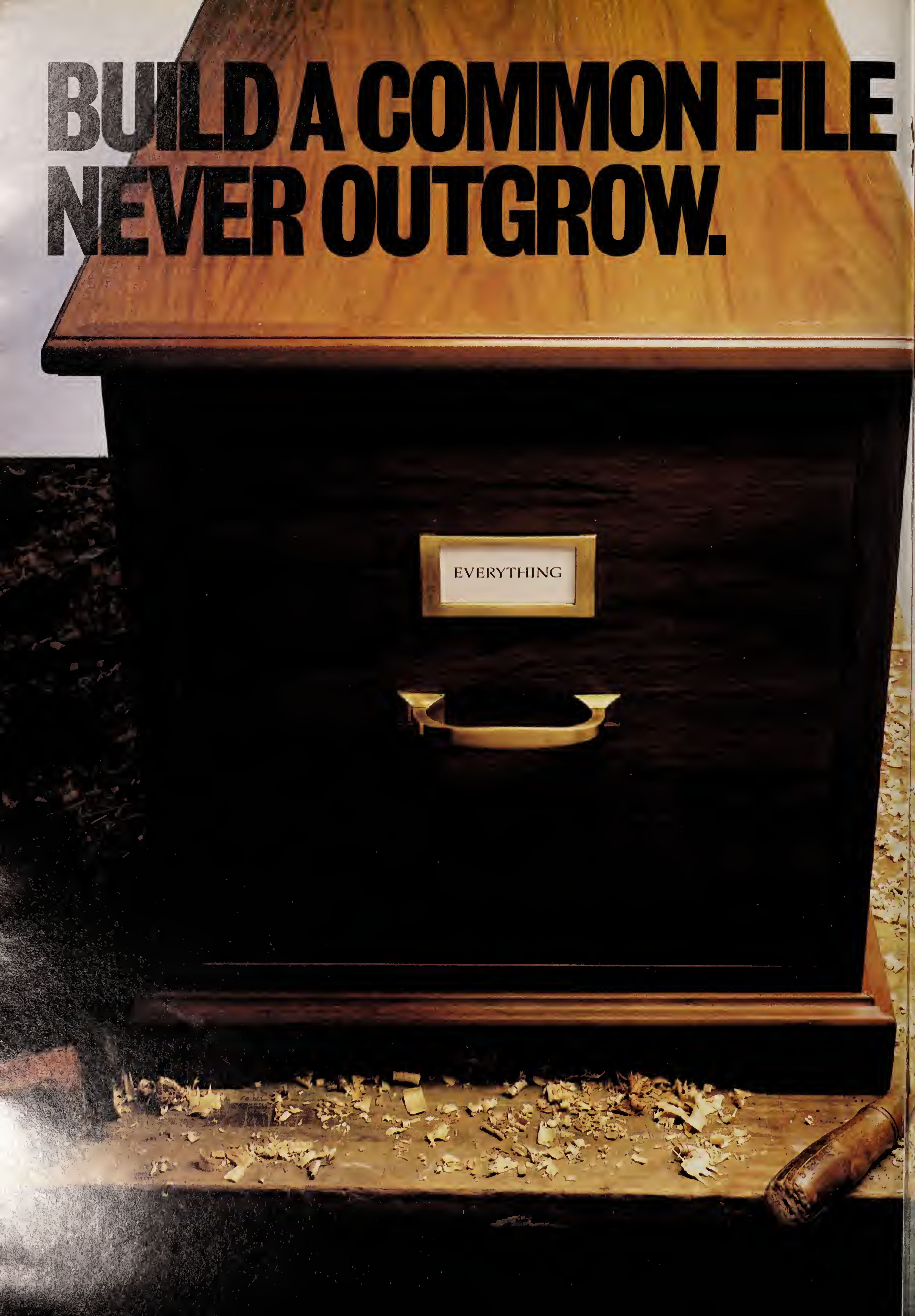
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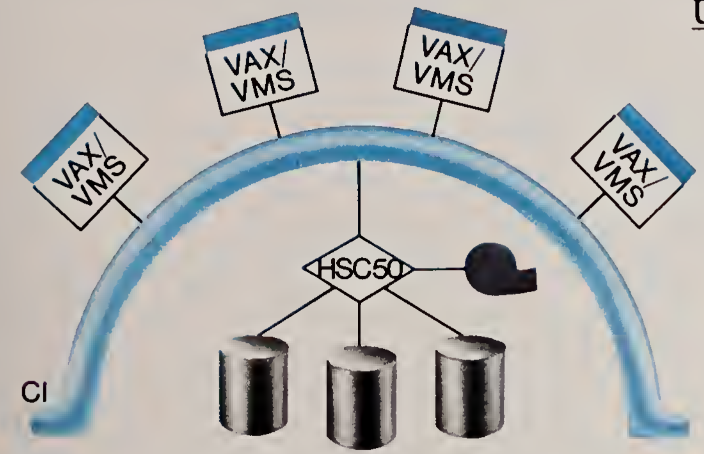

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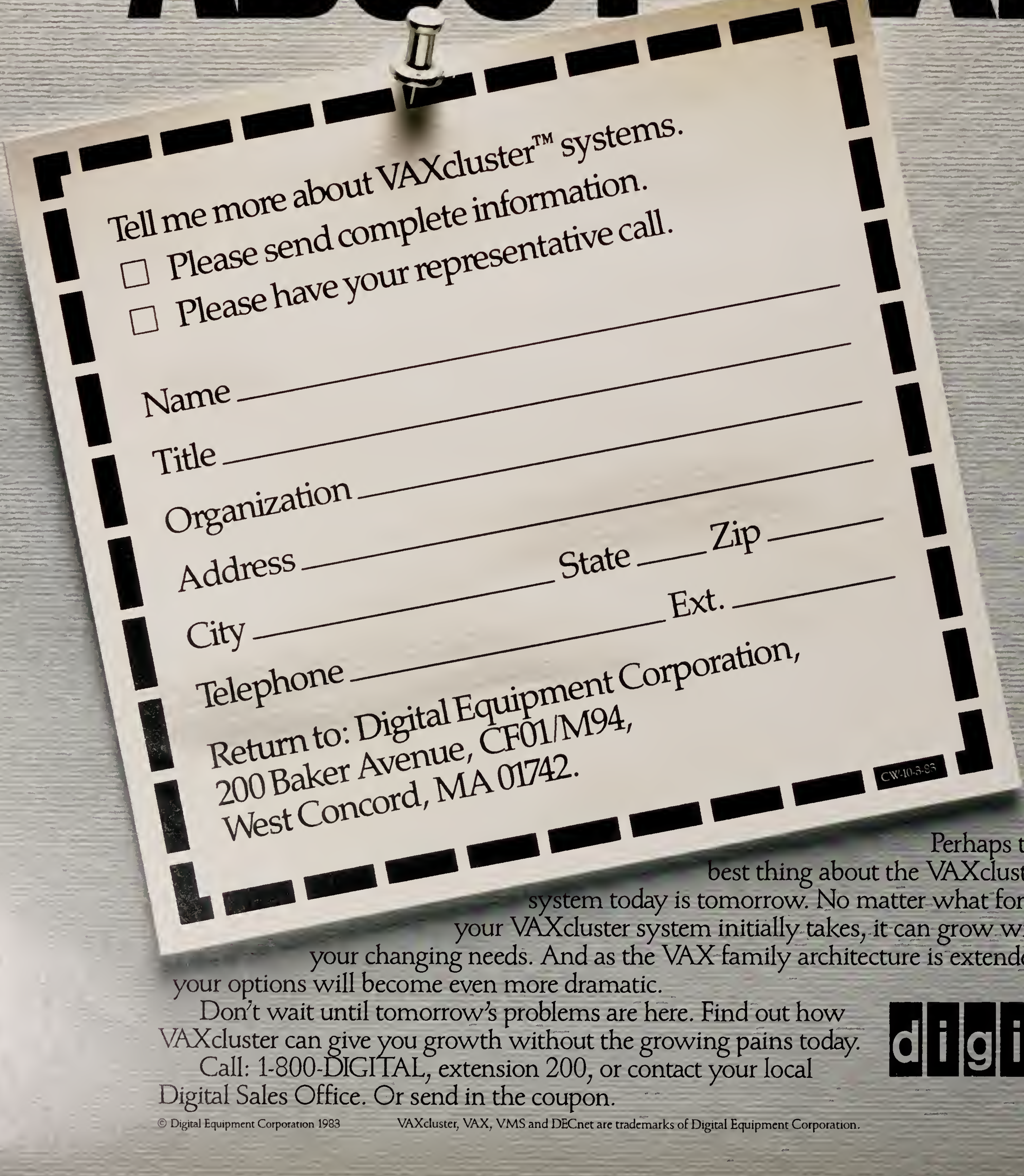

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development and competitive strategy, rather than merely an overhead item.

3. Rational Allocation of Resources.

A comprehensive information architecture approach should facilitate distribution of scarce information and communication resources so that they map more closely the firm's inherent information structure and its associated flows. To the extent that allocation of scarce resources is made in accordance with overall need determined by business mission, that allocation approaches rationality.

4. Security.

Information and data security within corporations has long been hampered by the artificial division between the paper world and the machine world. Corporations have built up elaborate mechanisms for protecting computer-held data only to find that once information is created in paper form, it easily flows to places where it could do potential harm to an individual or to the organization. As information technology spreads throughout the firm, and thus as increasing amounts of paper-held and manipulated information are absorbed into the machine domain, some improvement in ability to protect corporate information can be expected.

As the number of end users increases in the interactive environment, security administration will become a greater problem, since it is frequently found that individual access profiles must be set for each employee, a process that is not yet highly automated. Certain Western European governments will soon require presentation of corporate data protection plans. An overall security plan not meeting standards will be de-licensed.

Information architecture can help this process by enabling the corporate security officer, either within MIS or working in conjunction with MIS, to grasp quickly the possible avenues of "leaks" of important information from one system to the next. Instead of having to classify information at the data element level, information architecture should allow aggregate summarizations of security classifications, thus simplifying the process.

Another important factor is that not only data, but written documents, reports and memoranda can be equipped with an "audit trail" listing the number, type and time of each access. Each time a document is printed rather than read on a CRT screen, a record would be made. The amount of connect time would also be recorded, along with various other factors useful to security analysis. Ultimately, documents themselves could be encoded with an "information structure domain," which would specify the limits within the corporate information system beyond which they could not be transmitted or accessed.

> ***'Information and data security within corporations has long been hampered by the artificial division between the paper world and the machine world.'***

5. Flexibility for Change.

The adoption of information architecture should enhance a firm's long-term survivability by adding flexibility for adjustment to severe destabilizing fluctuation in the environment. Dropping departments and divisions, cutting or adding workers, forcing speed-ups in production and stretching out activities without substantially increasing costs should be more manageable and controllable.

Flexibility of information and communications structure should also enhance the ability of aggressive employees to learn more and take on increased job responsibility as they pick up competence. Organizational units being temporarily underutilized should be able to switch over and take on other tasks, which have

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"spilled over" from another section of the organization, on a temporary basis. If a corporatewide system is properly planned, this switch over would be possible without substantial hardware, training or software problems.

6. Inventory of Systems and Identification of Backlog.

In the past, MIS used various tools for setting priorities, including project backlog lists, which indicated that the average months of backlog can vary nationally from an average 26 months to five years. Other tools used include system narratives and specialized technology for documenting systems. The global and systematic overview provided by information architecture should yield a clear view of the backlog, but as defined by more comprehensive criteria than usual. The inventory of systems that should accompany any information architecture project will show where the concentration of effort and investment is likely to have the broadest payoff.

7. A Note on Frameworks.

As there is no standardized methodology, information architecture should define an internally consistent language that bridges the communication gap between management and MIS. As it is applied to successively more detailed levels of the organization and as the individual data element level is approached, the fundamental properties, characteristics and internal logic of that language should not change.

When the focus shifts to how applications of technology can be directly related to strategic business issues, it should be realized that information architecture is not solely a technical solution. In fact, the technical side may be the least important. The key to the approach is that it provides a tool to communicate with and build consensus among nontechnical user managers and with senior management. All management should be able to discuss key issues coherently with reference to how information technology can be applied to meeting the business requirements of the enterprise.

About the Author

Edward Roche is an associate at The Diebold Group, Inc. in New York. He organizes the Diebold Research Interchange Service, a nonprofit organization that has reciprocal arrangements with a variety of institutions around the world. The service publishes a bulletin that summarizes ongoing research projects in high-technology, communications and management fields.

Roche is currently writing his doctoral dissertation in the Department of Political Science at Columbia University. The dissertation will focus on the political process within the Department of State Advisory Committee on Transborder Data Flow.

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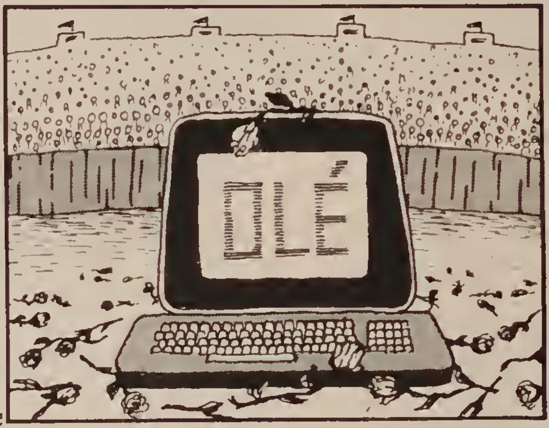

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Education Before Change In Systems Implementation

By Gloria S. Bronsema and Peter G.W. Keen

The complex process of developing large-scale information systems is too often marked by failure. During the past decade, several methods have emerged to improve the development process. They are: 1) systems development life cycle — a methodology for project management that focuses on planning, not coding; 2) software productivity tools, including structured methods, automated design and documentation aids and walk-throughs; and 3) implementation strategies — strategies that concentrate on managing organizational change caused by new technologies and systems.

The focus of this article is on the last method — implementation strategies. There is a growing body of conceptual and empirical (descriptive and prescriptive) research that provides the basis for implementation strategies that are as well-formalized as the systems development life cycle. The implementation cycle is the behavioral equivalent of the systems development life cycle. It emphasizes consulting skills and facilitation and defines the role of implementor as that of change agent.

We will first discuss implementation education as the vehicle for change. One study indicated that the likelihood of success in an implementation effort increases substantially if there is a strong commitment to use education to lead the implementation process, rather than to use training to follow it. Two additional studies suggested that education has the potential to be a major, formal component of the implementation cycle.

We will discuss the principles that were used in one particular education intervention workshop called "Preparing for IPS" (Integrated Processing System). The workshop was given in a major bank, hereafter referred to as Megabank, in a country we will call Hyperion. (A central branch is generally regarded as a single country.) The purpose of the education intervention workshop was to prepare middle managers for a large-scale systems implementation in which their commitment and participation were crucial to its success.

A Case Study: Megabank Hyperion. Integrated Processing System is a real-time processing system that integrates the major services and products of an international bank, Megabank. IPS is a strategic innovation in terms of the bank's technology, business activities, work flows and organization. Although the system was originally intended to be highly generalized, in practice, substantial local modification was needed to adapt it to the local banking procedures, government regulations and market characteristics.

The success of this system, which is being implemented in more than 60 countries, has varied widely. In some countries, IPS has been disastrous — behind schedule, disruptive and expensive. In other countries, however, implementation has gone relatively smoothly.

Megabank Hyperion is a medium-size central branch and is just beginning the IPS implementation. Responsibility for implementing IPS in Hyperion falls to the operations division, known as the "back office" of the bank. Operations handles all aspects of processing, including

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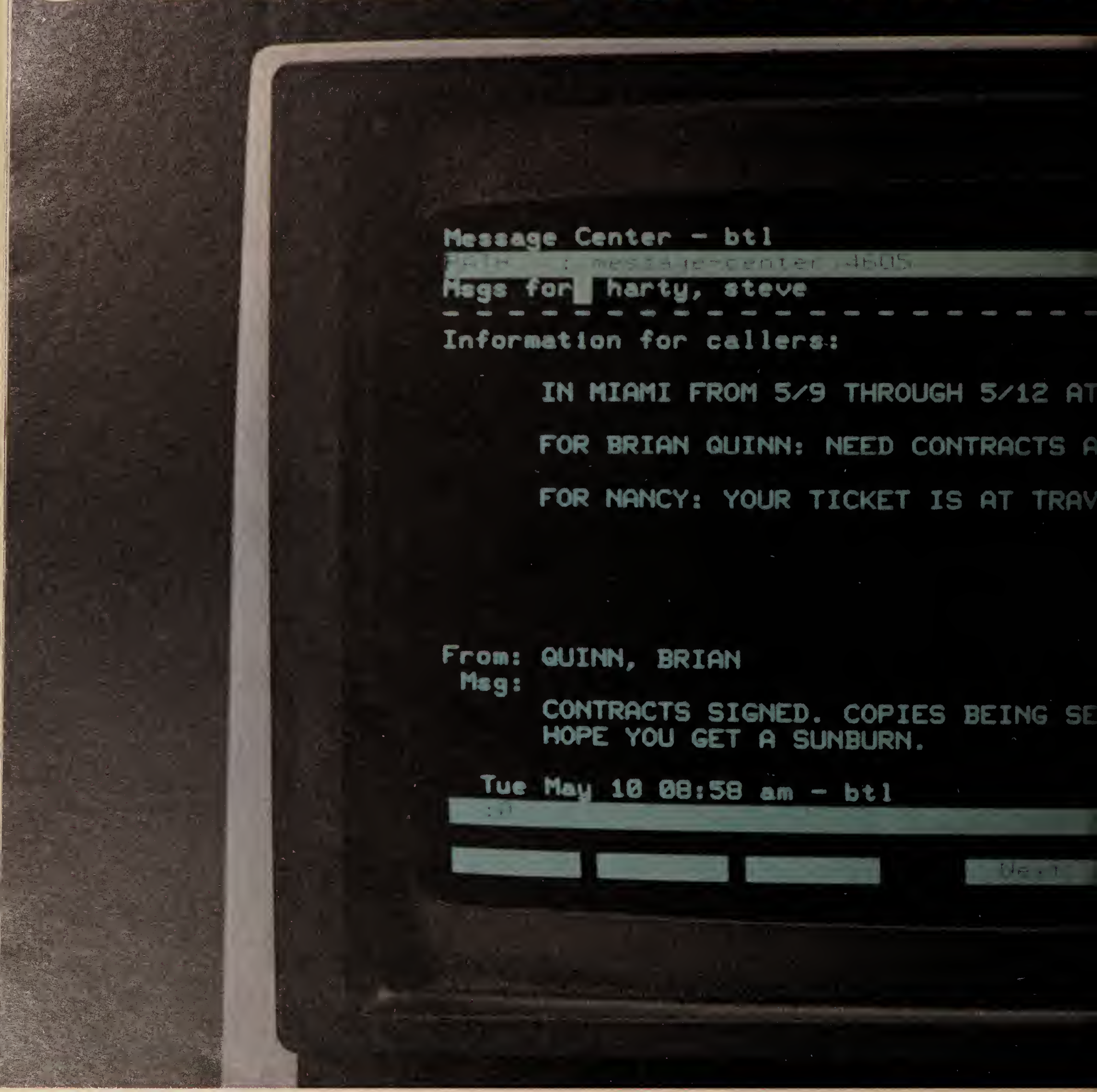

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Message Center - btl
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Msgs for  harty, steve
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Information for callers:

      IN MIAMI FROM 5/9 THROUGH 5/12 AT

      FOR BRIAN QUINN: NEED CONTRACTS A

      FOR NANCY: YOUR TICKET IS AT TRAV




From: QUINN, BRIAN
 Msg:
      CONTRACTS SIGNED. COPIES BEING SE
      HOPE YOU GET A SUNBURN.

  Tue May 10 08:58 am - btl
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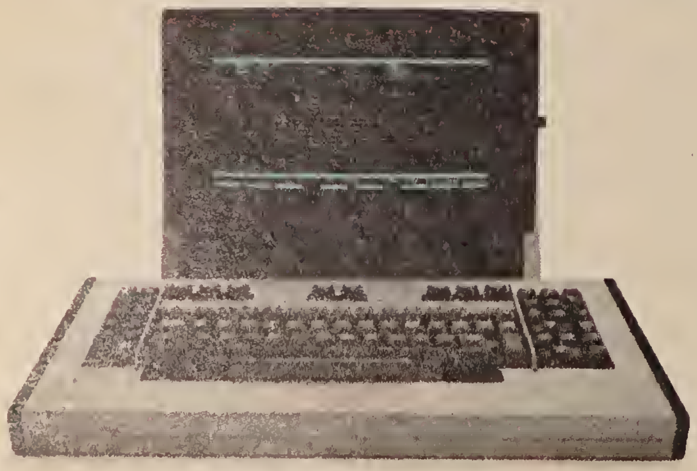

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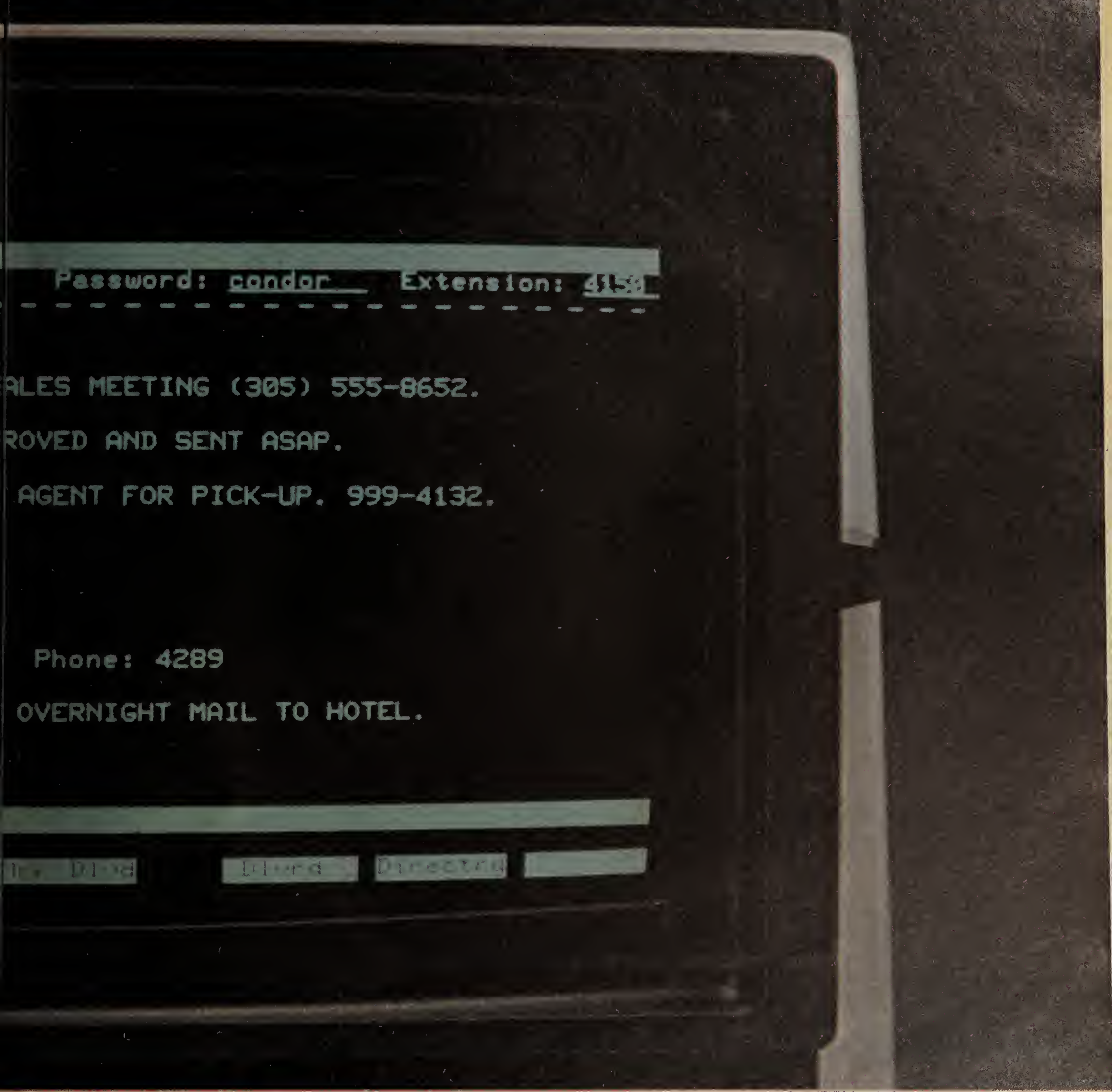

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computer components. The marketing division, known as the "front office," has up to now focused mainly on loans. But because the worldwide corporate banking market is rapidly changing, credit-based products (loans) are only marginally profitable. Growth in revenues and earnings depends on asset-based and fee-based services, such as leases, balances and trade financing. It is essential that the implementation cycle involve both operations and marketing divisions because IPS will serve as the technical base of Megabank's marketing strategy for electronic banking.

There is, however, a distinct culture gap between the marketing and operations personnel in Megabank Hyperion. Marketing personnel are considered the "elite," and they know little about computers. Operations personnel, including systems personnel, are psychologically and physically isolated from marketing, as is the case in most branches.

IPS implies a major shift in how the bank should function. Thus, in order for the IPS implementation to be successful, this culture gap will have to be closed. Although many managers speak of the need for "user involvement," marketing does not want to participate. Hyperion's attempts to narrow the culture gap and to involve others in the implementation of IPS have thus been largely unsuccessful. The question is, "What should or could Hyperion management do next?"

Since the bank's need at that point was to change people's attitudes and actions, some intervention aimed at achieving this end was needed. While a training program had been tried before, it had largely been ineffective. This time, Hyperion went outside the organization for help. Hired as external consultants, we were asked to develop a workshop that was explicitly aimed at "technology mobilization" for IPS.

The main objectives of the IPS workshop were: 1) to close the culture gap by changing attitudes between operations and marketing and 2) to ensure that participants understood the implementation plans and the need for initiating actions on their own (action creation). The workshop was based on general models of implementation, with case studies and structured interviews being integral parts of the design process.

Eight Principles

Our particular work — the design and delivery of the workshop — was based on eight general principles. The principles are grounded in implementation research. We believe these principles are valid and valuable and can serve as general guidelines for the design of future education interventions. Our design was based on the following principles:

1. Use data from the participants' world as the basis for examples and discussions.
2. Demonstrate senior management commitment.
3. Provide a forum for participants to express concerns and to get answers to their questions.

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4. Provide an opportunity for action.
5. Move the sequence of events; that is, begin with the concrete, move to the abstract, then to the reflective and finally to the active.
6. Limit the number of participants: select a heterogeneous group.
7. Select a teacher with research, consulting and teaching skills.
8. Conduct follow-up activities.

Each of these principles is discussed in detail.

1. Data from the participants' world. Information technology is at the same time both concrete and abstract. The concrete components are the hardware and the program code, and they can be presented clearly in any course or seminar. The abstract components, which are so often critical in implementation, are not so clear or easy to discuss. These abstract components include:

- General psychological, organizational and political issues.
- Management process.
- Systems-user culture gap.
- "Resistance to change."
- User involvement and management commitment.

These abstractions must be made concrete so participants can move from principles to procedures, from ideas to action, from intentions to commitments.

In many ways, education for implementation is a form of action research. A key first step is to identify feedback to the organization regarding its perceptions, problems and needs. Hidden agendas must be brought out, and examples and discussions based on the participants' context (not on some distant, general and semirelevant case) must be presented.

We developed a general approach to collecting such data and have applied it in many settings. Using this approach in Megabank Hyperion, we spent approximately one week interviewing 30 people at all levels of the organization. A structured interview format was used to focus on:

- The subjects' knowledge and perception of the information system and the implementation process.
- How their work is likely to be affected by it.
- Their expected and anticipated role in the implementation.
- Their views on how and when a course, seminar or other education intervention could help smooth implementation.
- Their recommendations on what management should be doing to help provide commitments, resources, directives and mandates.

The Hyperion interview data revealed consistent, well-articulated areas of concern that needed to be

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discussed openly. Managers often had an incomplete or even inaccurate understanding of their own organization, especially of the lower levels. For example, they tended to assume that subordinates had more understanding of the system and its goals than the subordinates really did; or, the managers ascribed more commitment and involvement to subordinates than really existed.

The interview data also provided a base for writing a case to be used in the implementation workshop. Case studies are useful components of any course on implementation. Too often, however, the case is a disaster study. Using such a case has several disadvantages. It associates computer systems with failure and provides only negative guidelines: "Don't do the stupid things these people did!"

For this particular IPS implementation workshop, we developed a case study that showed a fairly successful implementation strategy. The workshop focused on issues raised in the interviews, such as: 1) the need for user involvement to be real and sustained; 2) the importance of liaison roles; and 3) the need for careful phasing, which may conflict with management's wish to speed things up and meet artificial deadlines.

The case was presented as a development effort similar to Hyperion's. It was a form of "faction" — factual fiction. In other words, the terminology, jobs, concerns expressed and potential problem areas in the case more or less matched Hyperion and IPS.

Implementation Effort

Implementation is a dynamic process including cognitive and affective components. The stakes are often high; people see computers as affecting their sense of self, their jobs and skills, politics and organizational relationships. It is hard to elicit these perceptions and processes except by letting people express their views in their own way. We therefore view our research as a form of detective work and discovery.

There are contradictory perceptions of "fact," subjective perceptions and historical factors that shape the context of the implementation effort. The data collected via the structured interviews is a form of text to be analyzed in terms of themes, motifs and key words, in the same way as a literary text is.

Both implementation research and implementation education benefit from being rooted in the data taken from people's own words. The "texts" from the interviews were integral to the design of the IPS workshop and to the case in particular. The use of anonymous quotations from the interviews gave a concreteness, immediacy and "relevance" to the education curriculum and process.

Obviously, it is more expensive to spend one to two weeks interviewing than it is to use "off-the-shelf" material to design a workshop. But whether it is effective to do so, in terms of cost/benefit trade-offs, depends entirely on the behavioral objectives of the education effort. If the goal is information sharing rather than action creation, off-the-shelf components may be fully adequate. But we conclude from our experience in Hyperion and elsewhere that the investment in collecting data to

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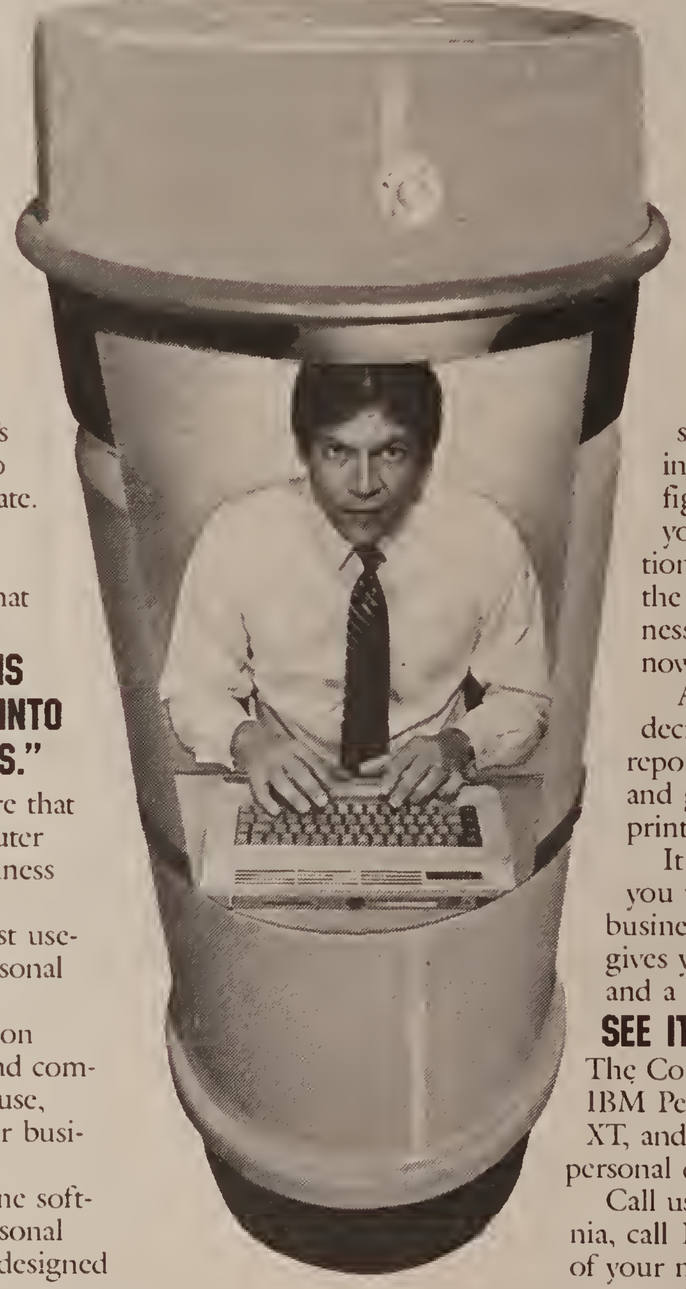

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Columbia Data	500, 900, MX Series, Commander
Comlog	5000
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Computer Dev.	Mini Term 1206
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CPM Marketing	MCS PT
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Crown Comm.	EZ Com
Franklin	ACE 100, ACE 1000, ACE 1200, MicroDisk/2M
Future Data	Micro Data 2080, GSI MDD050
G.S.I.	MDO 60, MDO 50
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Panasonic	Time 2000
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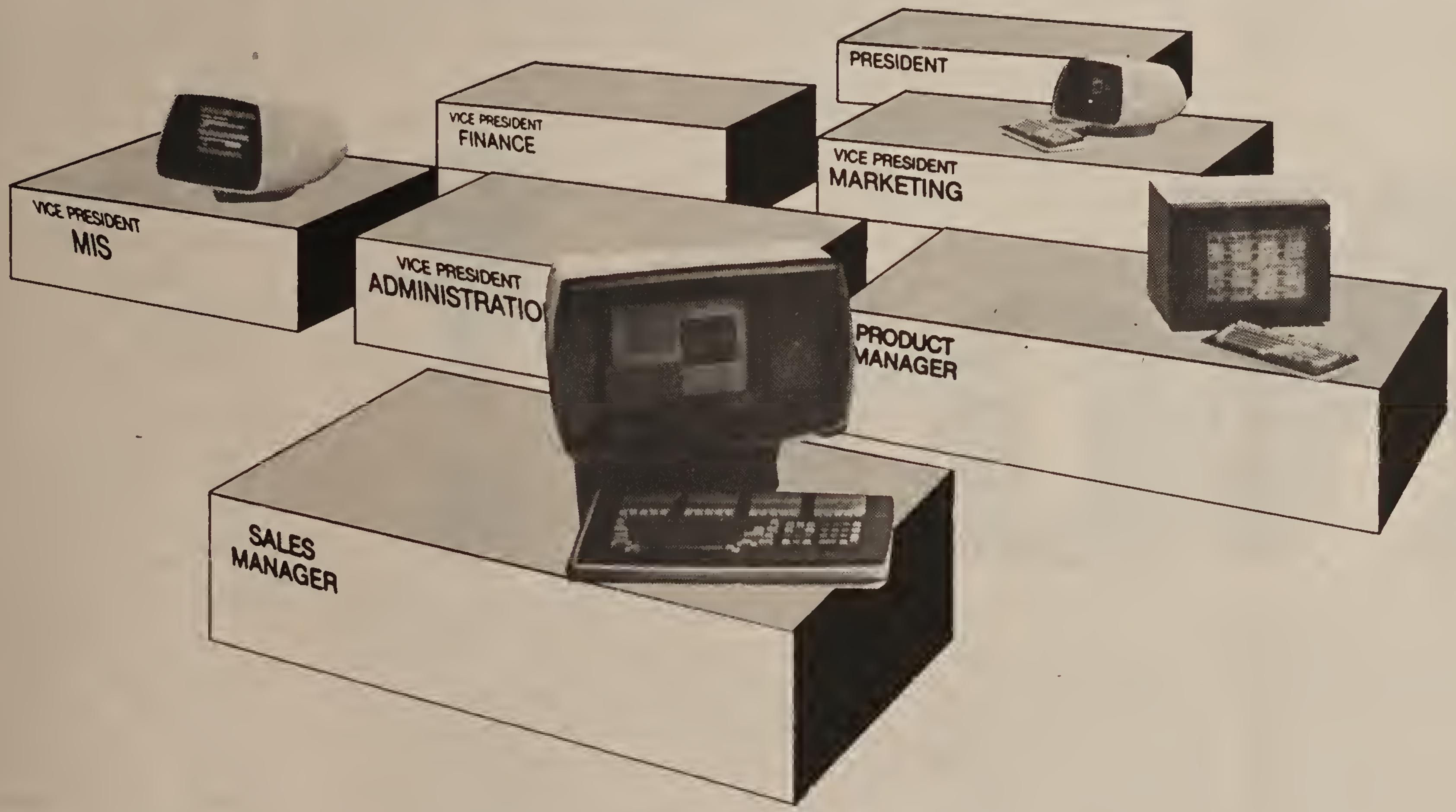

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ground the content and process in the participants' reality is often essential to make education a mobilizing force for implementation.

2. Senior management commitment. The need for senior management commitment is well established in the MIS implementation literature. With IPS, virtually every manager interviewed spoke about his commitment. However, there is a catch: What is commitment? Is it an expression of support, a willingness to allocate funds and staff, active leadership or a statement of expectations? While many senior managers see their verbal statements as "commitment," their subordinates watch what they do rather than what they say.

Effective commitment involves a public investment of time, prestige and attention. In other words, the manager's position, prestige and success are linked to the success of the implementation effort. The manager provides authority and accepts accountability. Subordinates who are given authority are also *de facto* held accountable.

It was clear from the IPS interviews that subordinates tried to decipher what management's real intentions were, and they ascribed motives and set their own agendas according to their deductions. Lack of senior management commitment or inconsistent commitment was an important signal to others in the organization. This finding was very relevant, and we made it clear to Hyperion's senior managers, particularly to the country head, that there was little point in designing an IPS workshop unless they demonstrated — not just stated — their commitment. Such a commitment required that the country head explain the wider goals and context of IPS, instead of leaving it to the staff to work out the details. (Not surprisingly, workers often assume that the main intent of the organization is to reduce head count or beat the unions.) Thus the country head and head of operations addressed workshop participants to clarify the business aims that led to IPS and to outline the overall planning process, roles and phasing.

In addition, workshop participants had the opportunity to indicate in writing what additional actions, resources or information were needed from senior management. Unanswered questions, unresolved issues and suggestions for implementation were presented in a memo to senior management at the end of the workshop. A week later, the country head scheduled a meeting of senior managers and workshop participants to discuss the memo: Concrete expressions of commitment should not end with the last day of the education intervention.

Unless senior management continues to play an active role in the implementation process, it is unfair to ask subordinates to make commitments that depend on managerial involvement. Valid tests of senior managers' commitment are their willingness to be subjected to awkward questioning by subordinates, to go on record and stake their prestige and to respond to their subordinates' statement of needs.

Since the McKinsey Corp. study established commitment as a key factor for effective implementation, it has been accepted as conventional wisdom. We agree. However, our case studies suggest that when examining "commitment," one needs to pay particular attention to the perceptions of subordinates as well as to top managers. Only then can concrete mechanisms be developed for communicating senior management commitment to the rest of the organization.

3. Forum. The paradigm of implementation as a process of social change within the organization is the theoretical base that guided our research, as well as shaped the design of the IPS workshop. A key theme in this paradigm is that "resistance" needs to be viewed as a legitimate response from an organizational system that sees the cost of change as being greater than the expected benefits.

The teacher should encourage and respond to the open expression of resistance, not smooth it over or suppress it. The process of "getting it out" is necessary. As one workshop

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participant said: "You talked about your problems and frustrations. It was good that people talked; it was perfect. People had to talk, to get it out, or it would have been a mistake."

A key conclusion we drew from case studies in general was that implementation requires an educational forum as the base for information sharing, attitude change (that is, open expression of concerns and needs and mutual understanding), action creation and skill building. It seems clear from normative empirical discussions of user involvement that such forums are an essential component of any strategy for involvement. Furthermore, we believe that involvement, commitment and communication require a forum.

4. Action. Many of the participants did not consider Hyperion's earlier IPS training efforts to be relevant to their jobs. While training involved information sharing, it did not lead to the "unfreezing" that has been identified as a first step in effective organizational change. The Lewin-Schein (1969) model of the consulting process has three stages — unfreezing, moving and refreezing — and has been adopted by many MIS researchers.

Information sharing is unlikely in itself to lead to unfreezing: What is required is attitude change. In turn, attitude change may not help the moving stage: Methodologies for planning and explicit commitments are needed.

As previously discussed, the workshop was designed to put management at risk and to challenge it to demonstrate commitment. It was made clear to the country head and to the head of operations that the vague goodwill concepts of commitment and involvement must be translated into action. Participants were told they had the right to expect commitment and involvement from senior management. At the same time, participants were asked to act and to make plans for their own involvement and commitment.

"User," "involvement," "commitment" — words matter. A major concern in the design of the workshop was to define the behaviors that represent these words. Methodologies and planning frameworks were provided to help the participants translate words and attitudes into actions.

Workshop sessions moved toward specific definitions of roles and specific commitments. Most of the participants had never been involved in a major computer project. Nonetheless, they were ready to become "involved," but needed a vocabulary and set of methods to do so. Project phases, milestones and tasks were explained.

As there frequently is a passivity among staff in user departments, they have no idea of what they could or should do. The workshop also focused on roles: The teacher helped participants define who does what, not just what is to be done. Besides clarifying roles, the participants initiated role playing, and there was substantial active experimentation, particularly through the use of the case study.

> *'While training involved information sharing, it did not lead to the "unfreezing" that has been identified as a first step in effective organizational change. Unfreezing requires attitude change.'*

5. Sequence of events. Obviously, the exact content and sequence of sessions in a workshop will vary depending on the nature of the new system, the technology, the organization and the characteristics of the participants. Bearing this in mind, we believe there are some general rules about sequence of events that should be considered. Kolb and Frohman introduced a model of learning that focuses on four modes: 1) concrete experience, 2) abstract

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conceptualization, 3) reflective observation and 4) active experimentation. In retrospect, the IPS workshop was consistent with this model.

Concrete experience. The first session of the IPS workshop began with a hands-on exercise in which computer games were used to create "funds" that were transferred to bank accounts using IPS-type technology. This exercise served several purposes: It broke the ice, reduced fears of the machine, established the potential usefulness of IPS and, above all, made IPS concrete.

Abstract conceptualization. The next few sessions described the business goals and context of IPS in terms of abstract conceptualization of the Kolb-Frohman model. The complex analysis of the economic, market, political and organizational considerations that lie behind the decision to introduce an innovation of the scope of IPS may be well understood by senior management and many of the technical staff. However, the complexities are seldom understood by users. For this reason, a workshop session was spent reviewing trends in banking, competitive strategies and business goals that lead to IPS.

The workshop next discussed the likely impacts of IPS on people and jobs. Only after these discussions did the workshop describe the technology behind IPS.

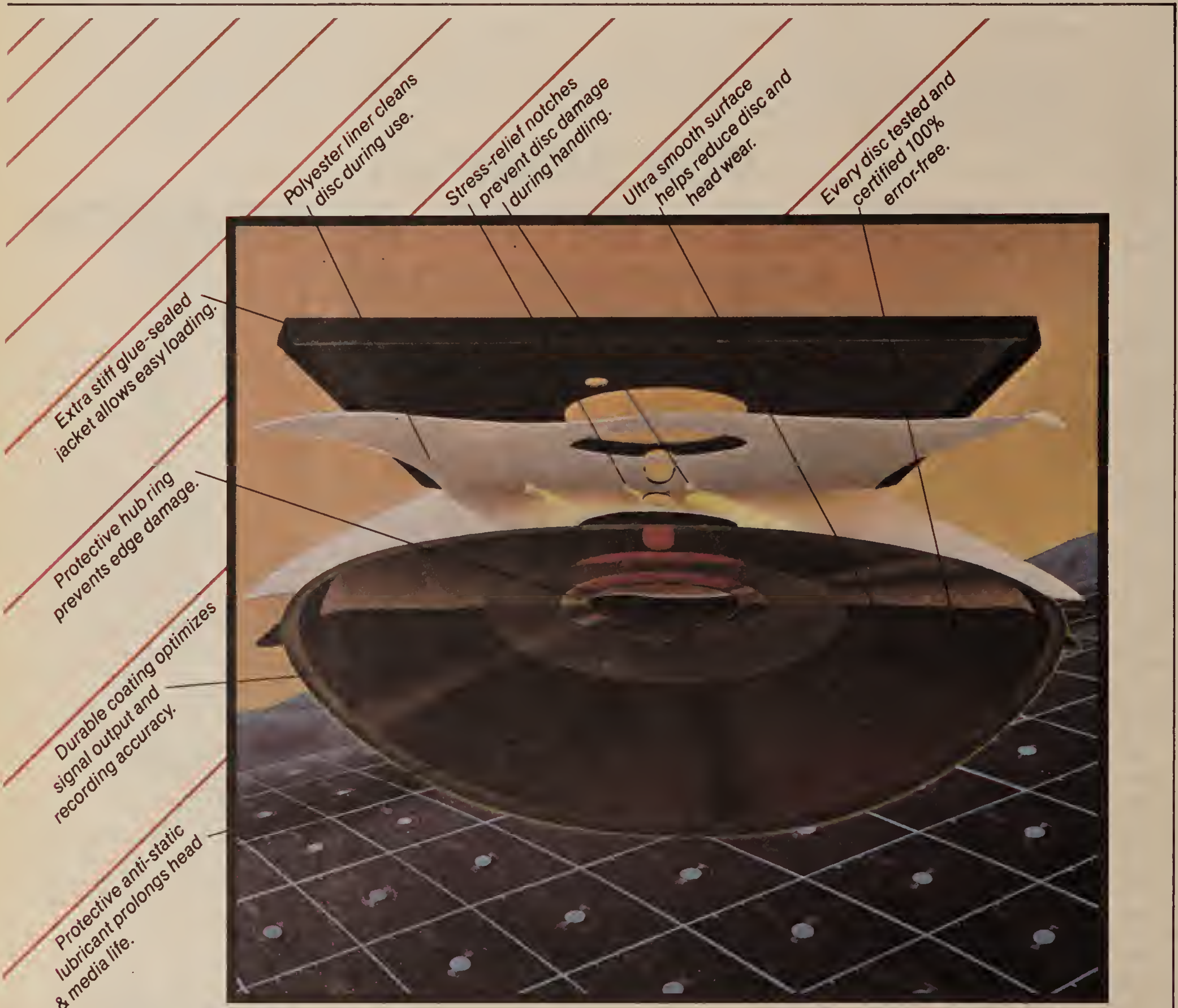
Reflective observation. The following workshop session began with a case study. As previously discussed, the case study was faction: It was similar to Hyperion's IPS implementation story. In this session, role playing was encouraged. The case was followed by an exercise called "Red Flags/Green Flags." The "flags" were anonymous quotations, many of them made by Megabank employees in Hyperion.

"Red flags" were quotations that signaled implementation problems. For example, "Technologists and business managers — it's a dialogue of the deaf!"

On the other hand, "green flags" were positive implementation signals. For example, "Technologists know the system and business people know the market. We need each other; we teach each other."

The flags were instructive in themselves, providing early warning signals and a basis for diagnosis of the participants' organization. Words are powerful; quotations are concrete. The use of quotations led the participants to work to relate the teacher's material to their own situation and to take positions.

Active experimentation. The participants' positions were shaped, extended, modified, explained and used in the final and longest segment of the workshop — planning agenda. The teacher presented a methodology for planning and a detailed framework and checklist for action. Project phases, timetables and issues were discussed. In relation to these discussions, participants defined their roles, commitments and actions. The workshop ended with the composition of a memo to senior management in which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> *'The workshop was a jolt to many: It seemed to have facilitated a culture integration through a culture clash. It was also seen as manipulative by some. In one way, education is manipulative, no matter how "participative" its intent.'*

participant questions and suggestions were expressed.

As stated earlier, the content, pace and sequence of events of a workshop depend on many situational factors. But a workshop needs to have a structure that moves participants forward via concrete experience, concepts, reflection and experimentation. In this respect, education is a dynamic process, and the IPS workshop was in itself an implementation effort, beginning with the unfreezing stage and ending with the moving stage.

6. **Number of participants/heterogeneous group.** A group of 10 to 15 participants is optimal. This size group is large enough to represent a diversity of opinions and yet small enough to provide the opportunity for all participants to contribute.

The second issue is the composition of the group. The culture gap between marketing and operations in Hyperion was probably no larger than it is in many other companies. Lack of mutual understanding between end users and systems personnel is extremely common in most organizations. While it is easier to build consensus within a homogeneous group, it is impossible to address actively solutions for a "culture gap" with such a group.

In Hyperion, marketing and operations personnel below the senior-management level had never before taken a course together. One participant stated that the workshop was "the first time marketing and operations had been in the same room together." Therefore, it is not surprising that at times there was substantial conflict among workshop participants from different functional areas. This was intended: The culture gap became a culture clash. The "Green Flags/Red Flags" game and the case study seemed to help people recognize the gap and clash and consequently to try to integrate the two departments.

7. **Teacher.** The role of the teacher is complex. We define it as that of an adviser combining and moving between the roles of teaching, research and consulting. Teaching is trust; that is, presenting general principles and methods and classroom management. Research is knowledge; that is, presenting data from this and other settings and providing theories and frameworks. Consulting is action; that is, giving advice and expertise.

The adviser needs a range of skills, for implementation education would be ineffective or incomplete if any of the skills were missing:

1. Teacher-researcher, with the consultant role missing: The workshop would be too abstract.
2. Teacher-consultant, with the researcher role missing: There may be a credibility gap as the teacher is seen as "selling" something.
3. Researcher-consultant, with the teacher role missing: Classroom skills are vital; there is a need for formal transfer of information and teaching of methodologies and concepts.

The supply of qualified advisers is a major constraint on effective implementation education, just as the shortage of qualified process consultants, liaison staff and change agents hinders implementation itself.

8. **Follow-up.** Most follow-up research of corporate education programs tends to focus only on "happiness quotients" (that is, students are asked to rate the quality of the teacher and their own satisfaction with the course). Hyperion's training center staff distributed a teacher evaluation questionnaire to workshop participants. The teacher received an average rating of 8.8 on a

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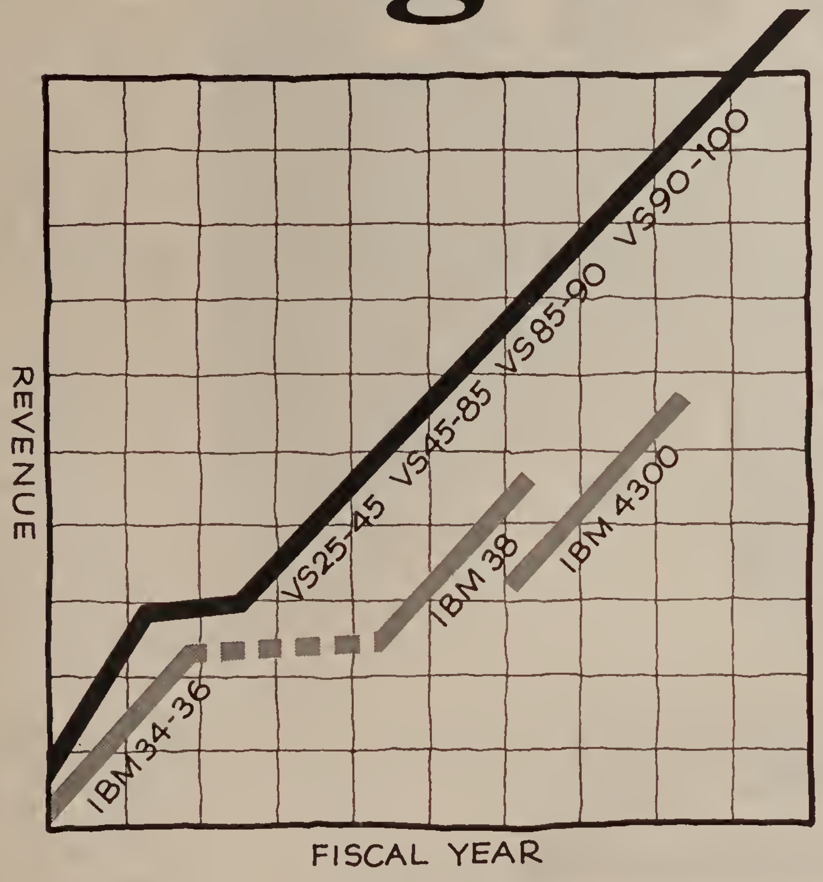

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nine-point scale, ranked on nine variables.

This information, however, did not tell us if the behavioral objectives were met, if the curriculum should be modified or if the course should be offered to others. High ratings may have little or nothing to do with learning. In assessing the impact of the IPS workshop, we were more interested in the satisfactory actions it stimulated.

The issue of follow-up is linked to that of behavioral objectives. It is almost meaningless to evaluate a program for which clear operational goals are not defined *before* implementation. After the IPS workshop, we interviewed all the participants to assess the immediate impact of the workshop in relation to the stated objectives.

Close the culture gap. The first objective was to close the culture gap. The workshop was a jolt to many: It seemed to have facilitated a culture integration through a culture clash. It was also seen as manipulative by some. In one way, education is manipulative, no matter how "participative" its intent. People in the marketing department spoke of a new feeling of commitment to IPS after the workshop. The following comments were typical:

"Don't get me wrong, the course was very good, but it was brainwashing!"

"This workshop is called 'Preparing for IPS.' You should change the name to 'Committing to IPS!' "

"Before this workshop, I was *told* I would be a part of IPS. After the workshop, I *feel* a part of it."

Create action. The second objective was to create action. Since the main goal for the workshop was to influence action, its success mainly depended on follow-up activities directly initiated as a result. Recommended actions by participants included: 1) sharing information and experiences with colleagues; 2) pushing the workshop down to junior-level and up to senior-level employees; and 3) meeting with senior management.

Over the next month, several actions were initiated. Workshop participants met with the country head. The meeting proved fruitful, both as another forum for operations and marketing to share information and ideas and as a vehicle for new commitment for further education.

Regarding further education, an operations manager was assigned to be responsible for IPS training in Hyperion. However, when he was interviewed, the manager admitted he felt uncomfortable with his new role and said: "The problem is *how* to educate — with terminals, with conferences . . . with what?"

This remark is disturbing. The workshop was a force for unfreezing: It broke open the status quo and stimulated an awareness of the need for a wider, deeper education effort at all levels. The workshop also led to a significant increase in the resources committed to and the priority placed on education as part of the IPS implementation process in Hyperion.

However, without a plan for education strategies and methodologies, increased resources are unlikely to yield results. The long-term impact of the workshop and of the increased resources allocated for education can only be guessed at. The future will largely depend on Hyperion's ability to determine how to educate.

The principles described here may be valuable for designing and delivering a single education intervention to address issues inherent in implementing computer technology. But regardless of the success of one intervention, without a long-term, comprehensive education strategy, the workshop simply could have been lots of "sound and fury signifying nothing."

About the Authors

Gloria Bronsema is an independent management consultant based in Boston. She is a consultant to multinational corporations on the organizational impacts of the implementation of computer technologies.

Peter Keen is chairman of Micro Mainframe, Inc. in Cambridge, Mass. His current research interests lie in the areas of decision support systems, telecommunications and business policy and strategic computing education.

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CSO to Emerge From AT&T Divestiture

By Katherine Hafner
CW Staff

LIVINGSTON, N.J. — Perhaps the most prominent new acronym to emerge from the Jan. 1 AT&T breakup will be CSO, which stands for Central Services Organization.

Simply put, the CSO is the local companies' version of Bell Laboratories. Recognizing that the optimal setup would not be to disperse such an organization throughout the nation, but to maintain a central facility in New Jersey, the local companies each own an equal portion of the CSO, and the board of directors is made up of a representative from each region.

AT&T's goal is to have the CSO in full swing by Oct. 1 in preparation for the final split three months later.

Staffed mainly by former Bell Labs employees, the CSO is smaller and a bit different in its focus than its progenitor. While the main thrust of Bell Labs is toward research and development, proportionately less of the CSO staff will conduct pure research and must thus be more selective in its research endeavors.

"The CSO is really a continuation of the kind of work Bell Labs was doing for AT&T and the telephone companies in the past," explained Larry Bernstein, assistant vice-president for information systems development. "But there are certain areas of work we won't be involved in, such as developing integrated circuits or hardware development for switching systems."

According to Bernstein, another fundamental difference between Bell Labs and the CSO is that while Bell Labs routinely endorsed Western Electric's equipment, the CSO will not endorse any one equipment manufacturer.

"We'll analyze what's available, give suggestions as to performance and analyze reliability," Bernstein said, "but we won't make any recommendations. It's strictly a technical report."

The largest department at the CSO is the technical services department for developing generic plans and software to help the regions design and manage their communications networks, a CSO spokesman said.

(Continued on Page 66)

CSO Will Have Seven Sister Firms For Cellular Radio

The Central Services Organization, the offshoot of Bell Laboratories to go into operation when AT&T's divestiture becomes official Jan. 1, will have seven sister organizations devoted to cellular mobile radio.

AT&T's current cellular operation is called Advanced Mobile Phone Service, Inc. (Amps), a separate AT&T subsidiary. As of Jan. 1, Amps will be broken up into seven separate regions, each of which will act as a subsidiary of the corresponding regional holding company, according to Christine Davies, a spokes-

(Continued on Page 66)

Mohawk Offers SNA Capability For Series 21 Line

PARSIPPANY, N.J. — Mohawk Data Sciences Corp. has announced the availability of IBM's Systems Network Architecture (SNA) communications capability on the vendor's Series 21 family of distributed processing systems.

Designed to encompass both batch and interactive communications, Mohawk Data's Intelligent 3270 emulator reportedly enables Series 21 users to satisfy communications requirements within a multistation network environment.

The product allows the Series 21 to attach to an SNA network and permits the Series 21 to appear as an SNA remote batch terminal, enabling it to communicate with and function as a remote extension of a central site batch teleprocessing program or subsystem within an SNA environment.

Pricing begins at $1,500 per system from the vendor at Seven Century Drive, Parsippany, N.J. 07054.

DCA's INA, Concentrator, Mux Get IBM-Compatible Products

NORCROSS, Ga. — Digital Communications Associates, Inc. (DCA) has announced IBM-compatible products for its Integrated Network Architecture (INA), a network control concentrator and a bit-synchronous time-division multiplexer.

The Binary Synchronous Communications (BSC) Transport System (INA/BTS) is said to transport data formatted under the IBM 3270 BSC protocol through a DCA INA network.

The capabilities of INA/BTS include host selection in an IBM BSC environment, transmission of both 3270 synchronous and asynchronous data through the same telephone line, elimination of the overhead of poll/response through the network and efficient satellite links, a vendor spokesman said.

INA/BTS is available for a starting price of $995.

The Asynchronous Terminal Controller (INA/ATC) allows asynchronous Ascii terminals — either directly connected or connected via dial-up to the DCA network — to communicate with an IBM or IBM-compatible computer using 3270 BSC or Systems Network Architecture protocols.

Prices for the INA/ATC start at $8,950.

The company has also announced its Network Control Concentrator (NCC) for its INA series of networks. Working in conjunction with the DCA Series/300 network processors, the NCC collects and integrates exception reports from network processors throughout the entire network and allows the operator to direct commands to any processor and receive replies at the terminal, according to a vendor spokesman.

The NCC is available for $4,995.

Also introduced was Megalink, a bit-synchronous time-division multiplexer said to provide voice and data transmission in addition to network management and diagnostic capabilities.

Available in tabletop or rack-mounted enclosures, Megalink comprises its own stand-alone network or integrates into any DCA network. Megalink's features also include: trunk speeds from 50 bit/sec to 2.048M bit/sec, support of 128 ports up to 256K bit/sec and integrated voice and data support with four ports of digitized voice per interface card.

Megalink is available for $3,800.

More information is available from DCA, located at 303 Technology Park, Norcross, Ga. 30092.

Control Concepts Announces 3274 Protocol Controller Unit

MANASSAS, Va. — Control Concepts Corp. has announced the 3274 Protocol Controller, an addition to its line of IBM-compatible controllers and terminals.

According to the vendor, the 3274 functions like an IBM 3274 controller for up to 32 asynchronous Ascii terminals and printers. It is available in both IBM Binary Synchronous Communication and Systems Network Architecture/Synchronous Data Link Control models and can be configured with four to 32 ports. Setup is via a series of menu panels.

The 3274 can support over 100 models of Ascii terminals, including the IBM Personal Computer. Additional support of personal computers, color terminals and keyboard send/receive printers, password protection and graphics can also be configured, according to a spokesman for the vendor.

Starting price for this product is $4,950 from Control Concepts, 12004-B Balls Ford Road, Manassas, Va. 22110.

Display Station Unwrapped

SANTA CLARA, Calif. — Datastream Communications, Inc. has announced a multifunction display station said to be the first in a series of displays designed for use with its IBM 3270 Binary Synchronous Communications and Systems Network Architecture remote cluster controllers.

The 178 Display Station reportedly is compatible with IBM's 3178 and Digital Equipment Corp.'s VT52 terminals and can be used for minicomputer or time-sharing applications.

Its keyboard includes all features of the IBM 3278 keyboard, plus some operator productivity features found only on the IBM 3290 plasma display keyboard, a vendor spokesman said.

Features reportedly include a cost-effective, flexible alternative to 3178 terminals, access to IBM and minicomputer hosts from a single display station, networking flexibility for printers, enhanced IBM 3290-style keyboard functions, dynamic reconfiguration of 3270 keyboard layouts on an applications basis, ergonomic design and compatibility with any serial RS-232 Ascii printer.

The 178 Display Station costs $975 from the vendor at 2520 Mission College Blvd., Santa Clara, Calif. 95050.

Bell Labs' Offshoot to Handle Cellular Radio

(Continued from Page 65)

woman for Bell Atlantic, one of the seven new regions.

The cellular solution promises to solve the problem of overcrowding of radio channels for mobile telephones. Unlike traditional mobile systems, which work through high-powered central base stations, cellular radio works through a series of different cells, each containing its own low-powered transmitter.

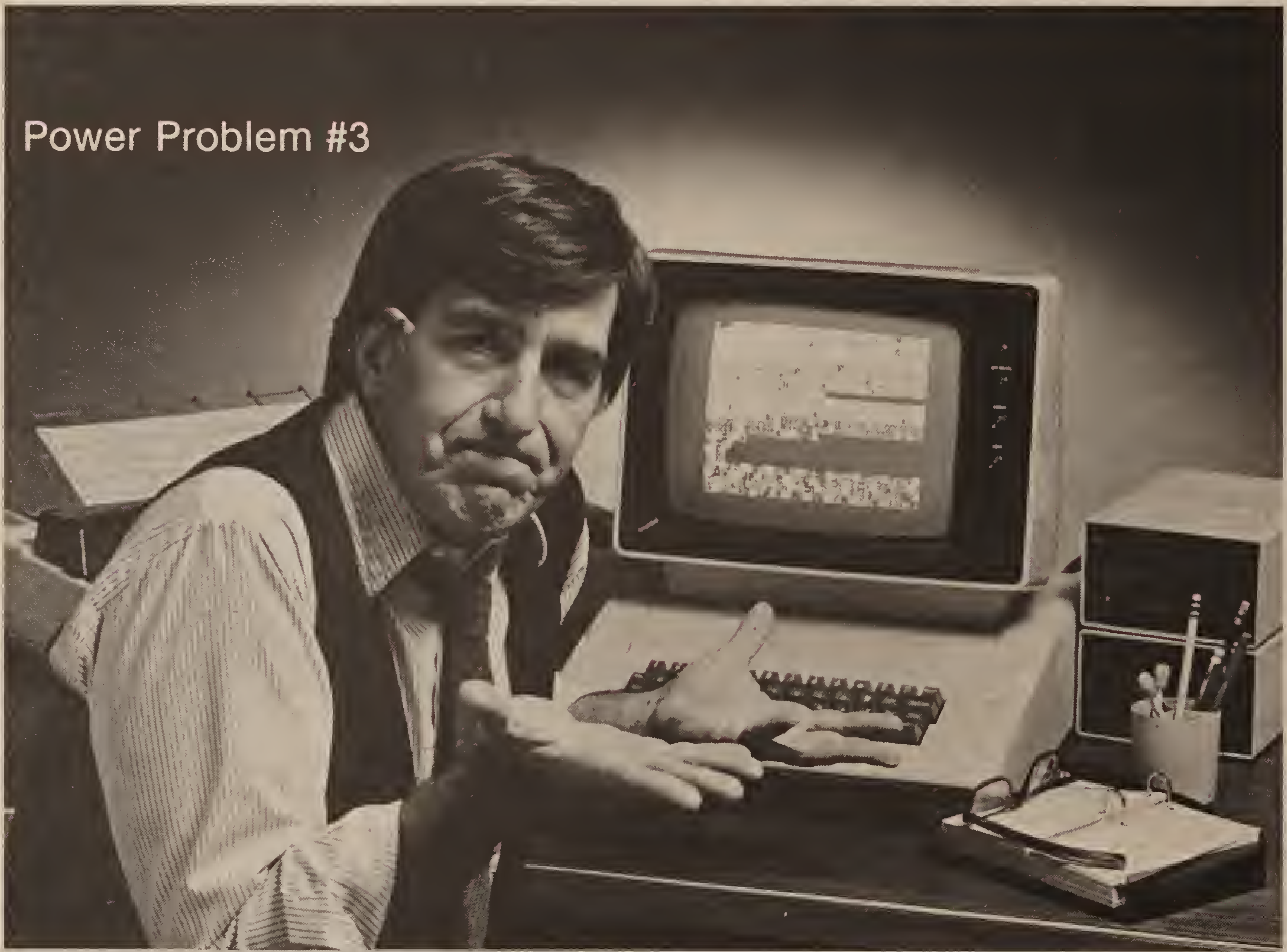
Since cellular communications allows for frequency reuse, there is little restriction on the number of mobile radios that can be operating at a time.

The extent to which each regional company delves into cellular services depends on its own level of interest, according to Davies. The individual regions will also be responsible for preparing applications to the Federal Communications Commission in order to obtain licenses.

In Chicago, for instance, the American Information Technology (Ameritech) region in the Midwest will be the first in the nation to provide cellular services to its customers this November. The Chicago service will be called Ameritech Mobile Communications, Inc., and the equipment for the system will be supplied by OKI Advanced Communications of Hackensack, N.J., and Motorola, Inc.

The Pacific Telesis Group (Pactel) covering California and Nevada will operate a cellular unit called Pactel Mobile Access.

Bell Atlantic Mobile Systems is the name for the Bell cellular subsidiary in the Atlantic states, and Southwestern Bell Mobile Systems, Inc. is the name for Southwestern Bell's subsidiary.



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AT&T Split To Form Arm For Research

(Continued from Page 65)

Five subsets of the technical services department are: the technology systems area, to provide technical and operations systems support for the networks; the applied research area, to keep the regions up-to-date on technology; the information systems development area, to design and develop operations support systems; the network planning area, to provide planning support for network and operations systems architecture; and applied research, to conduct research in science, math and computer systems.

For day-to-day operations support, the engineering and operations area will provide support on switching, interoffice facilities, distribution services, operator services and special services.

In addition to technical planning and basic research, the CSO will provide the operating companies with many of the services formerly offered by Western Electric and AT&T's general departments.

On the nontechnical side is CSO's administrative services, representing a distinct minority (7,200 out of 8,800 CSO employees are in technical areas). This division will preside over access tariffs, personnel, finance and industry relations.

Whether the CSO will be able to follow in the successful footsteps of Bell Labs, out of which have come 20,000 patents and four Nobel Prizes, remains a question that only time can answer.

Switch Out For RS-232C

WATERTOWN, Mass. — Digital Laboratories, Inc. has introduced an RS-232C A-B-C-D switch said to operate under complete software control or with manual override.

The Digital ESP-1 Port Expander reportedly creates four RS-232C serial ports from one and allows switching to different printers and other peripheral devices. The Digital ESP-1 reportedly switches four lines per port.

Priced at $395, it is available from the vendor at 600 Pleasant St., Watertown, Mass. 02172.

Dual Data Link Model Out For Timeplex Microplexer

WOODCLIFF LAKE, N.J. — Timeplex, Inc. has announced a dual data link model of the Microplexer X.25 Packet Assembler/Disassembler (MX.25 PAD) that reportedly has been certified for use on three major U.S. public data networks.

The MX.25 PAD supports two separate composite links running simultaneously at speeds up to 9,600 bit/sec each; if one link fails, the other reportedly can carry all data traffic.

The vendor said the device has been certified on Tymnet, Inc.'s Tymnet, GTE Telenet Communication Corp.'s Telenet and Uninet, Inc.'s Uninet networks and has also demonstrated compatibility with the Datapac network operated in Canada by the Trans Canada Telephone System.

Prices for a complete MX.25 PAD start at $1,750 from Timeplex, 400 Chestnut Ridge Road, Woodcliff Lake, N.J. 07675.

Harris Enhances PBX System

NOVATO, Calif. — Harris Corp. has added automatic wake up, room-status display and an audible reminder that a phone has been placed on call-forwarding to the Harris 110 Private Branch Exchange (PBX) hotel/motel and business systems.

Attendants and guests can "program" the Harris 110 to place a wake-up or appointment reminder call, while the room-status feature allows each room to be assigned a code reflecting its status — reserved, occupied or in need of cleaning, for example, the vendor said.

The call-forwarding tone helps to ensure that users do not continue to redirect calls after they have returned to their rooms.

The Harris 110 PBX accommodates up to 111 lines and 20 trunks.

The PBX system is available in two models. The price for Model 674 is $7,500. Model 676 costs $9,000 and includes accounting codes capability and station message detailed recording capability. More information is available from Harris, Digital Telephone Systems Division, Novato, Calif. 94948.

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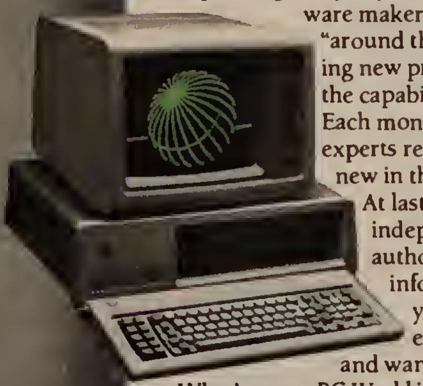

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Three Designed for Networking

NEC America Introduces Series of Modems

MELVILLE, N.Y. — NEC America, Inc. has announced a series of modems, including three modems which are said to be designed for networking configurations.

The SPN9600/4800/2400-U series modems are designed for point-to-point, multipoint and tandem data transmission over leased lines with data speeds of 9,600, 4,800 and 2,400 bit/sec. The series also features fast polling capability, diagnostic control and monitoring systems. Prices range from $2,000 to $7,000 per unit.

The SP14400-U is a high-speed modem designed to provide a 14.4K bit/sec data rate. It also includes local and remote addressable loopback, bit error rate and polling tests using a built-in test pattern generator and front-panel error display. It is available for $7,800, according to a vendor spokesman.

The DSP224AR is a 2,400 bit/sec full-duplex modem designed for operation on two wire-switched network lines. Diagnostics include local and remote loopbacks, bit error test using a built-in test pattern generator and front-panel indicator. It is available for $1,195.

The DSP208A/B is a 4,800 bit/sec modem compatible with the Bell 208A/B modem. It reportedly can be used over the dial-up network and two-wire/four-wire private line circuits. It is available for $1,750 per unit.

The SP0801-U is a mounting rack designed for the DSP series and lists for $800. More information on these products is available from NEC America, located at 532 Broad Hollow Road, Melville, N.Y. 11747.

Bridge Receives OK to Work Xerox Gateway on GTE Nets

CUPERTINO, Calif. — Bridge Communications, Inc. has announced that it has received approval from GTE Telenet Communications Corp. to work its Xerox Corp. Ethernet local-area network gateway over GTE's data networks.

Bridge said its gateway, called the GS/1, would now be able to connect Xerox networks to host computers via GTE's packet switching and by means of the CCITT X.25 protocol.

Consisting of modular hardware and software divided into three logical modules, the gateway acts as a communications link between an Ethernet and an X.25 network. Bridge said its gateway can link up with as many as 48 Ethernets.

Price is $13,500 with a $100 software charge from Bridge at 10440 Bubb Road, Cupertino, Calif. 95014.

Racal-Milgo Adds Encryptor To Product Line

MIAMI — Racal-Milgo, Inc. has added a wideband-circuit data encryptor to its family of products designed to secure the transmission of computer information.

The new device, dubbed the Datacryptor III, is said to prevent unauthorized access to information over point-to-point wideband circuits at rates of up to 112K bit/sec.

Equipped with V.35 and RS-232 interfaces, the encryptor uses the DES algorithm in the single-bit cipher feedback mode, which is said to permit protocol transparency.

Its price is $4,995. The product will first be available in November from Racal-Milgo at 8600 N.W. 41st St., Miami, Fla. 33166.

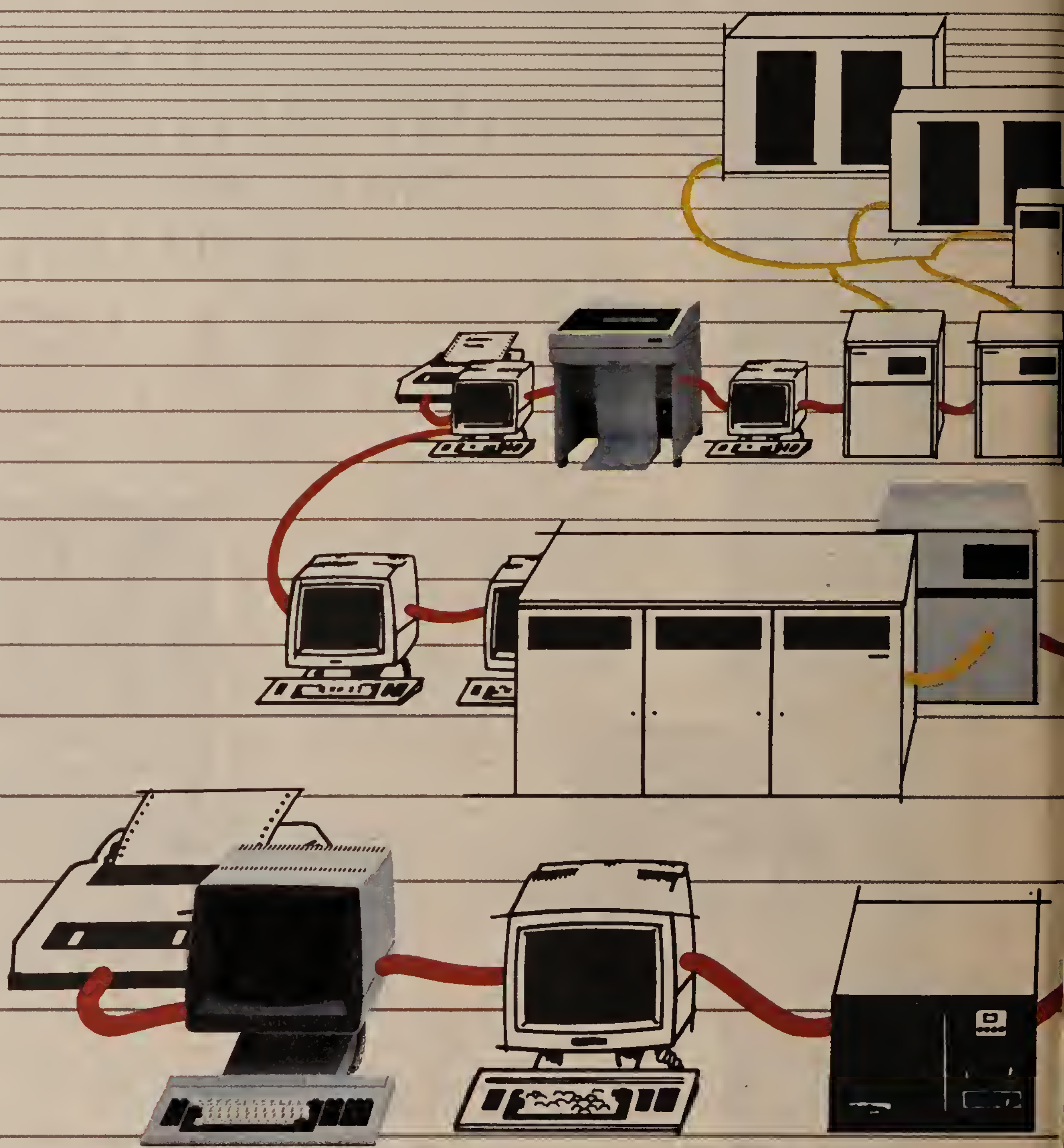
Wyse Unveils Two Terminals, One for X3.64

SAN JOSE, Calif. — Wyse Technology, Inc. has unveiled two 14-in. display terminals, one of them conforming to a subset of the newly adopted Ansi X3.64 standard.

Called the Models WY-50 and WY-75, the terminals have a nonglare green phosphor display and offer between 80-col. and 132-col. widths, a vendor spokesman said.

The 101-key detached keyboard is fitted with 16 programmable function keys and 32 control codes. Both terminals reportedly incorporate nonvolatile memory, which allows for the elimination of dual in-line package switches and enables the terminals' parameters to be entered from the keyboard, according to the vendor spokesman.

The terminals, priced at $695 and $795, are available this month from Wyse at 3040 N. 1st St., San Jose, Calif. 95134.



3270 Networking: No More No Man's LAN.

Imagine. 3270 Processing. IBM-Compatible Personal Computing. Local Area Networking. And SNA Compatibility. In One System.

Imagine a system that successfully settles the before now uncharted territory of 3270 local networking—that "no man's LAN" of unlinked and, thus, unrealized potential.

Imagine a system that delivers the power of 3270 processing, and the flexibility to build two local area networks from a single controller. Imagine being able to attach up to 120 devices to that controller. Or attaching

Loose Approach to DDP Avoids Some Problems

By Stephen Moore
CW International News Network

MELBOURNE, Australia — While offering many advantages, distributed computer systems pose several problems, such as costliness and lack of security. The solution to these problems might well be found in the "loosely" coupled approach to the multiprocessor as opposed to the "tightly" coupled alternative.

By definition, a distributed microcomputer or minicomputer system is a system composed of two or more micros or minis connected through shared memory or via high- or low-speed data links and running under the same operating system. Micro or minicomputer systems that use the shared memory interconnect approach have been coined as "tightly coupled systems."

Tightly coupled systems are systems in which all processors in the system can execute code out of the shared memory; I/O and all other system resources may be shared by the processors as well. Also, the interprocessor communications latency is low due to potential access time being only limited by the actual memory access time.

This type of system, however, poses many serious drawbacks for some applications. In addition to the expense of a shared memory and the tightly coupled system's relatively few security features, the operating system tends to become very hardware specific.

Alternately, loosely coupled systems do not share a common primary memory, and they offer the user a less confining distributed system and only a few shortcomings.

At the hardware level, there must be an explicit communications interface between the micros or minis. A communications interface implies that there is a higher latency of communications between processors than would be the case if they directly shared primary memory.

Changes in architecture are usually not easily made in tightly coupled systems or in multiprocessors. In contrast, a loosely coupled multiprocessor system allows for any processor to be changed without affecting the rest of the system. As long as the communications protocol is maintained, knowledge of attached processors is not required.

Three widely used interconnect methods for loosely coupled processors are the time-shared/common bus, mailbox/shared memory and global multiple-access bus.

With microcomputer systems, the global multiple-access bus is gaining popularity. Such systems include Datapoint Corp.'s Arcnet (token-passing system), Intertec Data Systems Corp.'s Compustar (parallel access bus) and Xerox Corp.'s Ethernet (carrier-sense multiple access with collision detection [CSMA/CD]). Of the three, the CSMA/CD system offers the best proposition when speed and bus utilization are considered.

Mailbox memory systems have been appearing on some distributed microcomputer systems, but they do suffer some drawbacks with microcomputer hardware.

If the information passed to an attached processor must go either via an I/O port or through a common area of memory, long delays may be experienced if other processors are transferring at the same time.

The Dewhirst Corp. of Melbourne, Australia, has manufactured a networked multiprocessor machine that is said to address many of these problems. The company's objective was to create a loosely coupled system that offered expandability, maximum performance and, most importantly, the capability of using existing software.

The objective of using existing software was achieved with two products:

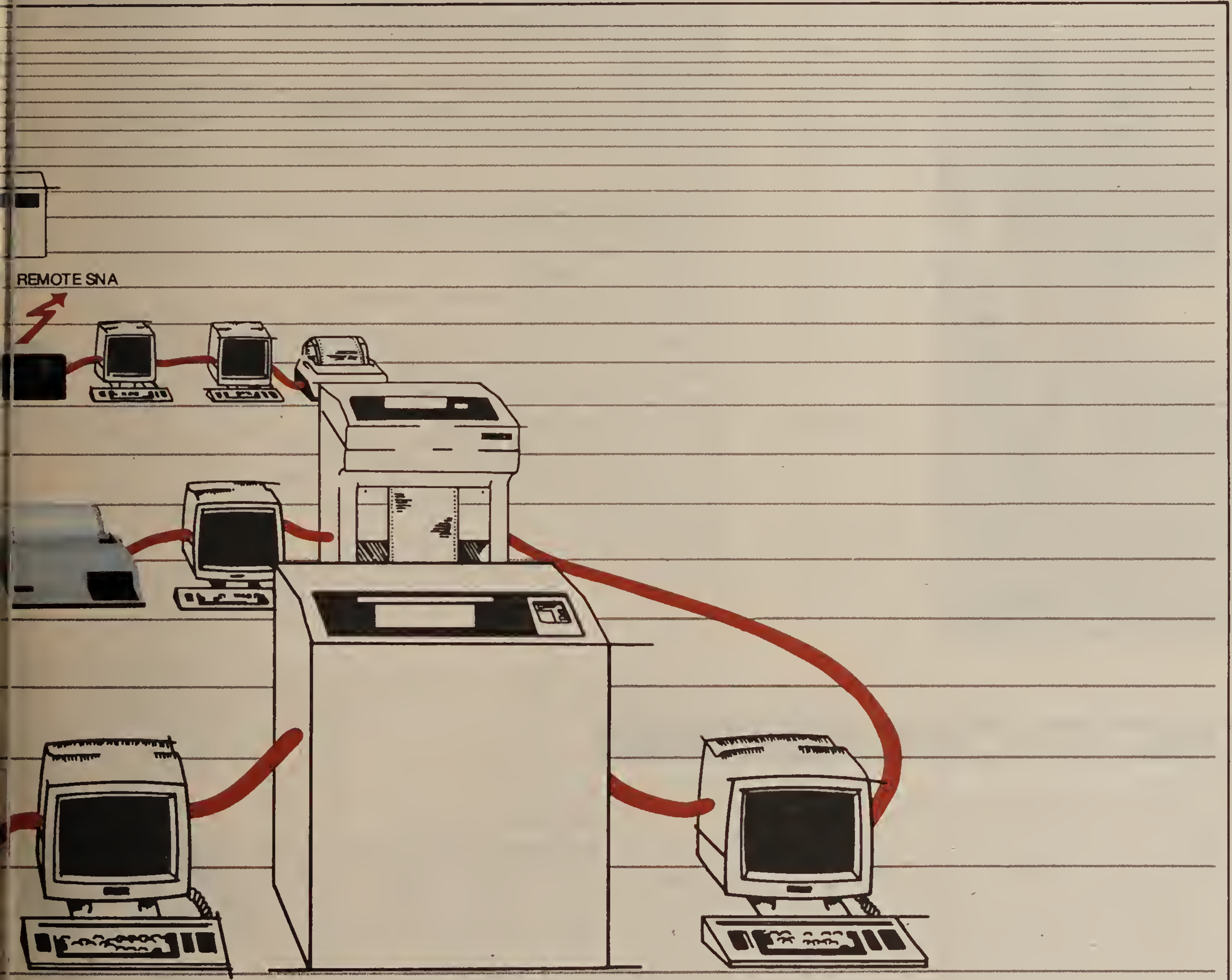
- A Musys Corp. network operating system called Turbodos, which runs Digital Research, Inc.'s CP/M software and the Micro Data Base Systems' MDBS III multiuser data base management system for sophisticated systems builders.
- The use of Zilog, Inc. Z80 microprocessors to give the widest microcomputer software base.

With Z80s acting as slave processors in the distributed system, compatibility with CP/M was maintained and the highest speed Z80 components were used. Also, a local floating point processor was placed on the card to provide a good scientific computing capability, according to the designer of the system, Mike Dewhirst.

Dewhirst said the slave processors operate with semicustom devices that include a high-speed direct memory access channel to move data to or from the slave at speeds 10 times in excess of those achievable by programmed I/O techniques.

Since two slaves can simultaneously perform this transfer with no contention, a 60-fold improvement in the data transfer rate can be achieved, he said. This type of communications system yields results comparable to those from a shared-memory system without the hardware and software complications.

Moore is an editor specializing in office automation technology at Australasian Computerworld. *This article originally appeared in* Computerworld's *Australian sister publication and appears here as part of the CW International News Network.*



four distinct controllers—and multiple coaxial links of up to 10,000 feet each—to any of those LANs.

Imagine the economies of a system that handles that networking with standard 3270 coax. That requires no commitment to special architectures or non-standard LAN technologies. And that, thanks to a multi-drop, station-to-station design, can eliminate thousands of feet of new coax.

Of course, such a system would have SNA compatibility. But it would also have a set of capabilities to dramatically increase efficiency and throughput, while reducing hardware configuration and support cost in *any* environment. Capabilities like multi-host and multi-personality support, application and address switching, session swapping and system printing.

This system would have an IBM-compatible personal computing option "built into" the network, not "bolted on" at the workstation—an option that would let you assign true 16-bit computing power, maintain overall MIS control, and share expensive resources, like hard disks and letter-quality printers.

Such a system would offer a full range of printers, including matrix, correspondence, and high-volume, high-speed models—all designed for maximum efficiency and convenience. And it would boast an intelligent display station that displays more than just data, but a mastery of ergonomic and aesthetic design as well. With multi-screen formats, anti-glare screen, low-profile keyboard, and a tilt-and-swivel pedestal that gives the station the smallest footprint in the industry.

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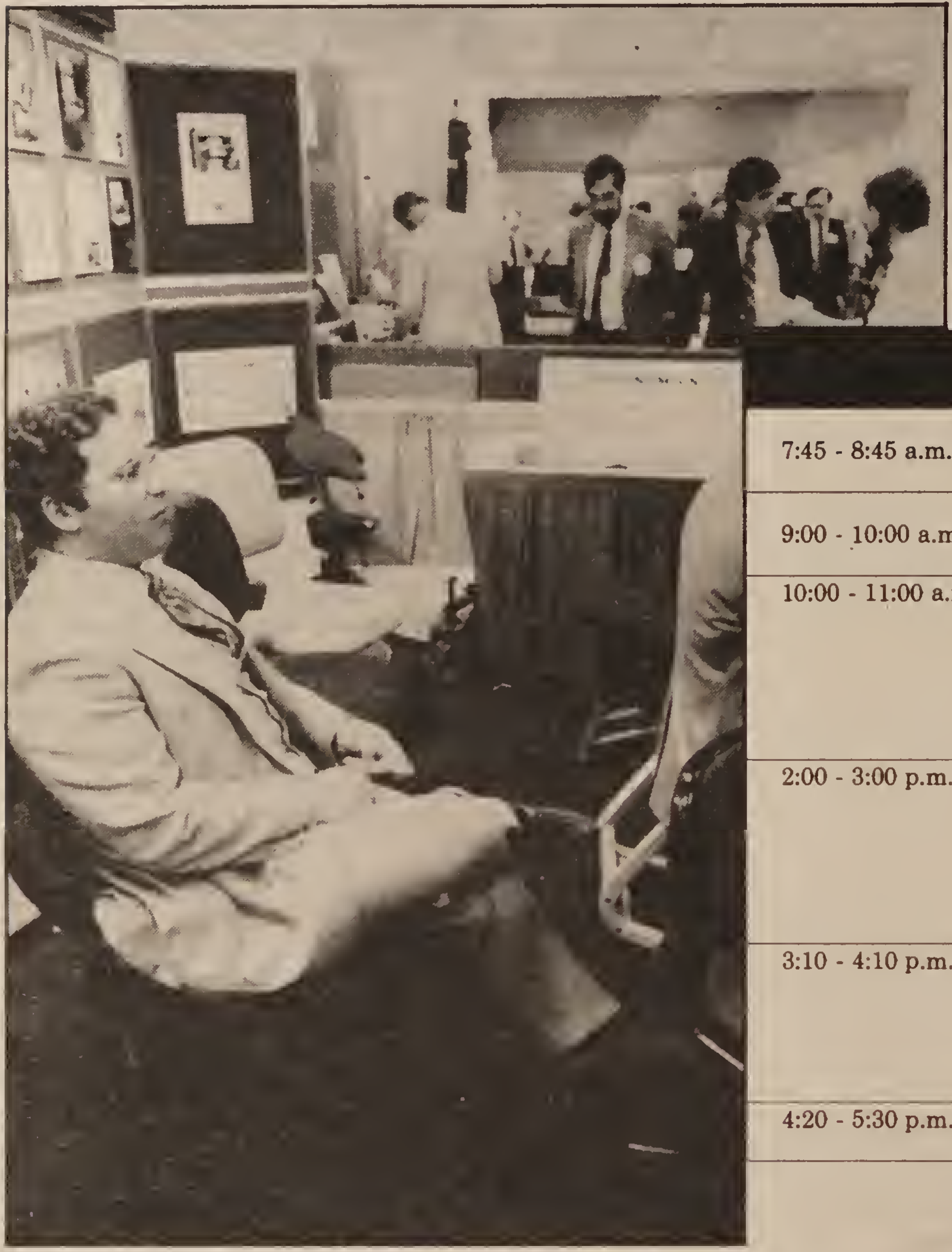
The Executive Microcomputer Conference and Exposition is coming to The Long Beach Convention Center on October 5-7.



The Conference Program

The computer show designed with you in mind! At the EMCE Conference Program you can learn in three days what could take three months.

Whether you're a DP/MIS Manager, a novice business computer user, vendor or entrepreneur, the EMCE Conference program will provide you with the information you need to make the most prudent and cost-effective software and hardware decisions for your needs.

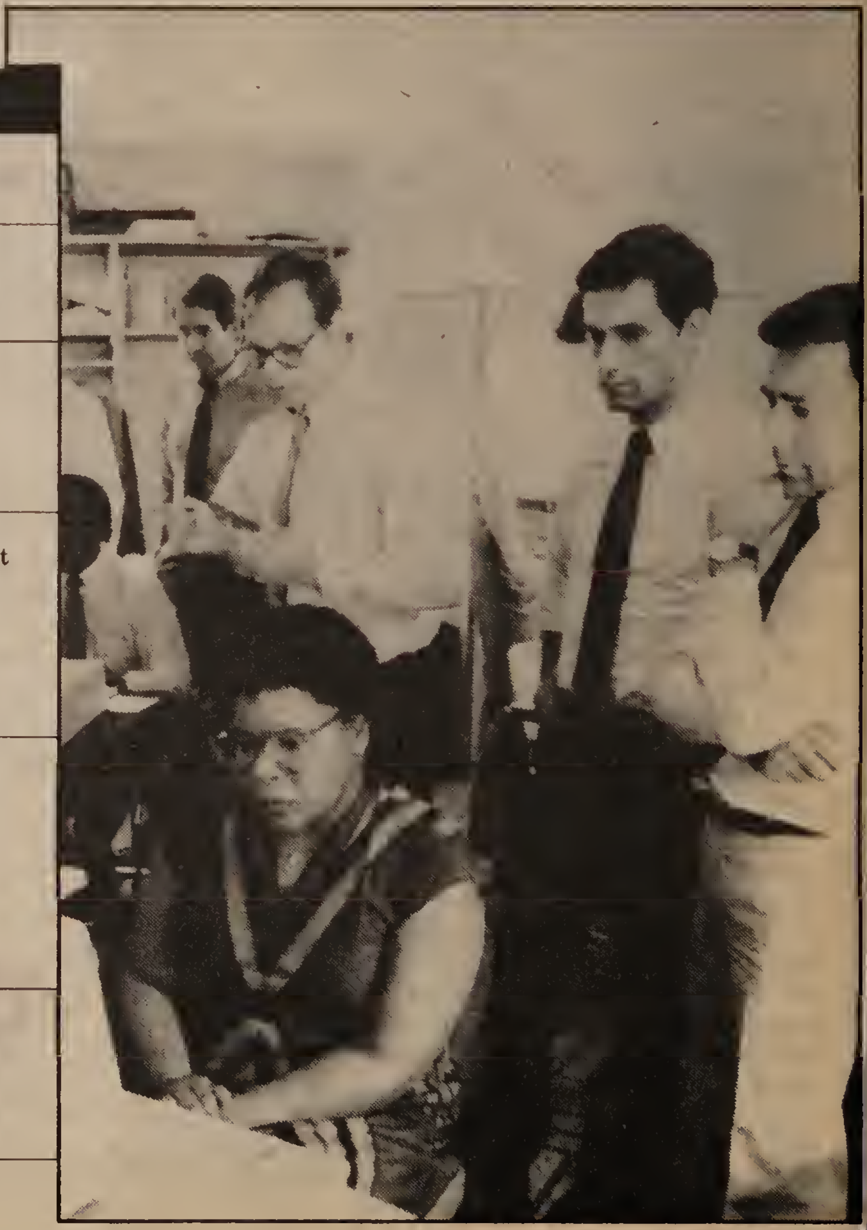
The EMCE Conference Agenda, October 5-7 1983

THURSDAY, OCTOBER 6, 1983

7:45 - 8:45 a.m.	EYE OPENER: **The Personal Computer in Communications** Dr. Larry Magid, Executive Vice President, Know How, Inc.
9:00 - 10:00 a.m.	KEYNOTE: **The Micro/PC Industry: IBM Domination & Future Directions** Adam Osborne, Chairman of the Board, Osborne Computer Corp.
10:00 - 11:00 a.m.	**The Executive/Professional Workstation** John Crudele, Sr. Manager, Management Information Consulting, Arthur Andersen & Co. **Software for Engineering Users** Aki Runchal, President, Analytic and Computational Research, Inc. **Channels of Distribution for Microcomputers** Jim Finke, President, Internetworx, Inc.
2:00 - 3:00 p.m.	**Spreadsheet Applications** Laurence Press, President, Small Systems Group **The Micro-Mainframe Connection** Dick Andersen, Director, AM/MS, Charles Bornheim, Principal, AM/MS; Marc Cummings, Senior Consultant, Mini/Micro Technology, Bank of America. **Packaging & Documenting Software** Howard Zack, Marketing Communications Manager, VisiCorp
3:10 - 4:10 p.m.	**The Future of Business Graphics** Dr. Irwin Jarrett, Chairman and Founder, Fingraph Corp. **The Engineering/Technical Workstation** Glenn Stewart, Industry Marketing Manager, WICAT Systems **The Personal Computer After Market** To be announced
4:20 - 5:30 p.m.	**Micros and the Changing Role of MIS** Dr. Michael Hammer, President, Hammer & Co., Inc.

FRIDAY, OCTOBER 7, 1983

7:45 - 8:45 a.m.	EYE OPENER: **Information Utilities for Personal Computing** Fran Spigai, President, Data Base Services.
9:00 - 10:00 a.m.	KEYNOTE: **The Fifth Generation Workstation & Artificial Intelligence** Pamela McCorduck, co-author, "The Fifth Generation: Artificial Intelligence and Japan's Computer Challenge"
10:00 - 11:00 a.m.	**Word Processing for Micros: The Next Step** John Murphy, Vice President, Advanced Office Concepts Corp. **Networking Microcomputers in the Corporate Environment** Arnold M. Roberts, Consultant, ADC Associates **Delivering Good Training and Support to the Corporate User** Karen Orton, Vice President, National Training Systems
2:00 - 3:00 p.m.	**The Information Resource Center** Tom Kosnik, Researcher, Stanford Business School, William G. Haven, Independent Computer Consultant **Portable Computers for Professionals** Doug Mosher, Division Manager, Sybex, Inc. **How to Raise Venture Capital** Moderator: Melody Johnson, Securities Analyst, Cable, Howse & Ragen Panelists: Tom Cable, Partner, Cable, Howse & Cozadd
3:10 - 4:10 p.m.	**Defining Integrated Software** Moderator: Gordon Eubanks, Vice President, Commercial Systems Division, Digital Research, Inc. Panelists: Fred Gibbons, President, Software Publishing; Kurt Lynn, Product Marketing Manager, VisiCorp; Jeanne Mowlds, Quarterdeck Office Systems **DBMS on Microcomputers** Scott Kuklin, Executive Vice President, Helix Corp. **Selling to the Corporate Account: Problems & Pitfalls** William H. Luden, President, ComputerEase
4:20 - 5:30 p.m.	**The Role of Microcomputers in Business** Moderator: Edwin H. Shepard, Product Manager, The Software Products Division, Alexander Grant & Co. Panelists: Richard L. Willmarth, Manager, Office Systems, Storage Technology Corporation; Marc Cummings, Senior Consultant, Mini/Micro Technology, Bank of America.



FOUR "IN DEPTH" TUTORIALS
Wednesday, October 5 from 9:00 a.m. - 5:30 p.m.

EMCE's "In Depth" Tutorials are all day seminars for managers who need a comprehensive understanding of one of the topics outlined below. All tutorials include two coffee breaks and a complete course notebook with reference materials. The tutorials will be held at the R.M.S. Queen Mary, Long Beach, CA.

How to Select a Business/Personal Computer

- How to Select the Features You Need
- Determining What Size Computer You Really Need
- What to Look For — and Look Out For — In Your Hardware and Software
- How to Determine What To Spend
- How to Select The Right Software Package For You
- How to Simply Define Your Computer System Requirements
- How to Minimize Costly Professional Help
- How to Select the Best System and Suppliers

Course Instructor: Arnold M. Roberts, president of ADC Associates brings to the tutorial extensive experience in seminar leadership having presented tutorials to managers across the country in the areas of data base management, networking and other application specific areas. Mr. Roberts has over twelve years experience in the field of Business Data Processing, with a strong background in systems analysis and design, technical support, in-house training as well as assisting corporations in the selection and integration of personal computers.

Microcomputers and Local Networks

- Overview of Networking and Definitions
- Hardware Issues
- Interconnection Technologies
- Microcomputers and Components
- Software Issues including Operating Systems
- Centralization vs. Decentralization
- Equipment and Systems: A look at Network Models
- Technology Trends and Future Directions

Course Instructor: J. Scott Haugdahl is a systems specialist at Architecture Technology Corporation, Minneapolis, Minnesota, a consulting firm specializing in computer architecture, including local networks and office systems. His work has included simulation and performance analysis of multi-processor computer systems, design and implementation of servers for local networks, and analysis of the latest developments and product offerings in the local computer network market. Mr. Haugdahl received his B.S.C.S. from the University of Minnesota Institute of Technology in 1980. He is a member of both the IEEE and ACM.

UNIX Tutorial for Managers

- The History of Unix
- UNIX — The Product
- Dynamics of the UNIX Marketplace
- Overview of Available UNIX Products
- Comparison of Hardware Systems
- A look at Application Software
- The Capabilities and Limitations of UNIX

Course Instructor: Jean Yates, president and associates of Yates Ventures specialize in researching UNIX systems, applications and the growing UNIX marketplace. Yates Ventures has been involved in extensive laboratory testing of UNIX related products and has been credited with producing 5 books on the subject. Well-known lecturer and industry consultant, Ms. Yates brings to the seminar both hands-on and technical experience of UNIX and UNIX related products as well as extensive user research.

Business Graphics for Managers

- Assessing Your Hardware Requirements Including Printers, Plotters and CRT's
- Assessing Your Software Requirements Including Operating Systems and Interfaces
- Evaluating Current Business Graphics Software
- Developing and Using Business Graphics Software
- Producing Pie and Bar Charts
- Understanding Program Compatability
- Creating Presentations with Graphic "Slide Shows"

Course Instructor: James Morrison, independent consultant and educator, has trained many people in the area of microcomputers. As a contributing editor to LIST software publication and newsletter, and an evaluation expert for FIRST SOFTWARE, Mr. Morrrison is a true professional in his field. He has published a number of books in the area of process which include subjects such as micro data communications, business software applications and "how to maintain" your microcomputer.

Special No-Wait tours of the "Spruce Goose" — FREE

EMCE has arranged for after-hours tours of the world's largest airplane, Howard Hughes' famed "Spruce Goose." Tours will be held Wednesday and Thursday, October 5 & 6 from 6:00 - 8:00 PM. You can pick up your free ticket from any exhibitor on the show floor.

Win a Personal Computer

Here's your chance to win the MORROW MICRO DECISION (MD3), the complete desktop system for the small businessman and professional. Just go to the InfoWorld exhibit booth and fill out a ticket. You may be the lucky winner.

PLUS you get the the EMCE Exhibition

An exhibit floor full of products and services for serious micro users. And exhibitors who are anxious to help you find the answers to your business problems.

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The Executive Microcomputer Workshop
Thursday and Friday, October 6 and 7.

An intensive two-day session for the busy executive or professional who needs to learn the basics of using a personal computer in the least possible amount of time. You'll learn how to use the IBM PC and have concrete experience with Lotus' 1-2-3 integrated software package.

The workshop will be given in conjunction with National Training Systems (NTS), a leader in providing microcomputer training products and sevices to large corporations.

The Executive Microcomputer Workshop will be held at the Long Beach Convention Center. Enrollment is limited.

NATIONAL TRAINING SYSTEMS, INC.

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Register with this form, or call: 1-800-225-4698 In Mass. call 1-617-879-0700

To insure advance receipt of your conference credentials, mail form before September 21, 1983, with check, credit card or P.O. payment to: EMCE, 375 Cochituate Rd., Box 880, Framingham, MA 01701.

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☐ Full Two Day Conference, Program & Exhibition	$295
☐ Thursday Only, Conference Program & Exhibition	$195
☐ Friday Only, Conference Program & Exhibition	$195
☐ Two-day Executive Microcomputer Workshop	$595
☐ Complete Three Day Package, tutorial (check one), exhibits & full conference registration	$440
☐ "In Depth" Tutorials Wednesday, October 5, 9:00-5:30 (select one only)	$195

☐ How to Select a Business/Personal Computer (TI)
☐ Microcomputers and Local Networks (T2)
☐ UNIX Tutorial for Managers (T3)
☐ Business Graphics for Managers (T4)
(In Depth tutorials will be held at the R.M.S. Queen Mary, Long Beach, California).

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- Group Discounts available on request.
- Registrations cancelled later than September 28 are subject to a $50.00 service charge. Registration may be transferred at no charge.

CWTS

Joint Venture With AT&T

Hilton Gets Video Network

BEVERLY HILLS, Calif. — Users will have access to 35 public video teleconferencing rooms by the end of 1984 when AT&T and Hilton Hotels Corp. complete their joint venture, it was announced recently.

The rooms will use AT&T's Accunet Reserved 1.5 service — formerly called High Speed Switched Digital Service — which offers data transmission of 1.5M bit/sec.

Hilton will build, own and operate the video conferencing rooms — the first of which will be in New York and Los Angeles. "The new digital network will supplement the corporation's existing analog network which has been providing video conferencing for businesses as well as entertainment and special events programming," according to Jim Collins, senior vice-president of marketing for Hilton.

Features of the Hilton network include the ability to:

- Set up video conferences with as little as one hour's notice.
- Originate and receive communications at any point on the net.
- Conduct simultaneous two-way communications between any two points.
- Communicate with compatible non-Hilton video conferencing rooms using Accunet.

Further information is available from Hilton Hotels, 9880 Wilshire Blvd., Beverly Hills, Calif. 90210.

Net/Alert System Enhanced For 16-Line Net Systems

CHERRY HILL, N.J. — Avant-Garde Computing, Inc. has announced an enhanced version of its Net/Alert network performance monitoring and management system for 16- to 64-line data communications networks. Previously, Net/Alert systems were unavailable for systems as small as 16 lines.

The Series 50 Net/Alert System for small networks includes all basic Net/Alert system functions, such as the standard real-time performance and status color displays and more than 24 Net/Alert reports and color analytical charts.

Application or transaction monitoring will be available as an option for small networks, with monitoring for up to eight applications priced at $25,000. An additional option is a host interface adaptor to transfer the Net/Alert data base to a mainframe for advanced statistical analysis using packages such as SAS Institute's SAS.

Each Series 50 includes a system control unit with fixed and removable disks, one or more line monitoring units, a color CRT and a printer. Up to 64 lines and 1,600 devices and the more than 30 Net/Alert protocols reportedly can be handled by the Series 50.

The Series 50 Net/Alert ranges in price from $75,000 to $142,000. Avant-Garde Computing is located at 2091 Springdale Road, Cherry Hill, N.J. 08003.

Firm Unveils Responsetime/1 For IBM Series/1

SAN FRANCISCO — Firesign Computer Co. has introduced a response-time monitoring and reporting system for the IBM Series/1 under the EDX operating system.

The Responsetime/1 is said to identify underutilized terminals and provide a security audit of program usage. The system runs on each CPU to be monitored and occupies 2K bytes of storage, according to a vendor spokesman.

Consisting of two main programs — a data capture program and a report generation program — the system is said to generate reports from the captured interaction data.

Priced at $965 for a single-site license, the system is available from Firesign Computer Co. at 524 Union St., San Francisco, Calif. 94133.

Excelan Offers Protocol Tool For Xerox Net

SAN JOSE, Calif. — Excelan has put into market a transmission control and internet protocol package for use with its own front-end processor for the Xerox Corp. local-area network.

The software, along with its Model 101 processor, makes up the first self-contained local-area network subsystem, according to the vendor.

The two-part package includes a protocol module and a Unix system networking kit. Said to conform to the U.S. Department of Defense's Arpanet specifications, the module also contains user datagram and internet control message protocols.

Provided in source form, the networking kit includes an I/O driver for the protocol module together with networking applications.

The price of the package is $75 in quantities of 1,000. The protocol module's source is listed at $20,000. Availability is scheduled for next month from Excelan at 2180 Fortune Drive, San Jose, Calif. 95131.

Everything you always wanted to know about mainframes in one little box.

Just when you think you have it all figured out, something new hits the DP world. You can't always hire a consultant to keep pace with new developments, but you can take advantage of Amdahl's industry-leading expertise. Keeping Current—Amdahl's unique video series—is the answer. Keeping Current is the time and money saving way for senior DP staff to obtain a clear and insightful analysis of mainframe problem areas, the latest trends, and future directions in hardware and software. You'll learn how to prevent problems, how to get the most out of your existing system, and shortcuts for daily operations.

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For more information, call Amdahl Education at 800-538-8460 ext. 6393. Within California call (408) 746-6393.

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ARE YOU KEEPING PACE WITH THE CHANGING FACE OF DBMS?

Watch for Computerworld's October 31st Special Report and get current— FAST.

How do you select the right DBMS for your installation? Are you fully utilizing the data base management system you have? Are you aware of the do's and don'ts for success with DBMS? Are you clear on the real benefits of DBMS?

You'll get the answers to these and a great many other questions you have on Data Base Management Systems in the pages of *Computerworld's* October 31st Special Report, "The Changing Face of DBMS." You'll get an examination of the latest market studies regarding DBMS. You'll get a look at the changing role of the data base administrator. You'll read about how microcomputer DBMS products are used for projects within mainframe-oriented DP installations.

And there's more. Lots more. Take a look:

- Trends in DBMS products for minicomputers
- The impact of DBMS on the information center
- New uses for data dictionaries
- The impact of fourth-generation languages on DBMS
- Controlling end user access to the corporate data base

You'll get application stores, case studies, news articles and tutorials in this Special Report. And the topics listed above will bring you right through to articles on installing a second DBMS and managing multi-DBMS shops. From search through set-up to multiple systems — you'll get a detailed look at the whole area of data base management systems.

And if you sell utility software packages, data management systems or data base management systems, here's where you'll find your customers next October 31st — reading *Computerworld's* Special Report on Data Base Management Systems. Your ad in this issue will assure them more complete information on the products in the field. Ad close for this Special Report is October 14th. Call your local sales representative at one of the offices listed below or call Don Fagan, Vice President, Sales and Marketing at 617-879-0700.

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Bantam Offers Pair of Micros Compatible With Pick

LOS ANGELES — Bantam Computers, Inc. has unveiled a pair of microcomputers compatible with the Pick operating system.

Called the Series 002, the systems come in a desktop model, the 002/7, and a floor model, the 002/15. The hardware is based on the Motorola, Inc. 16/32-bit 68000 microprocessor.

The desktop version comes with 128K bytes of random-access memory, a 10M-byte, 5¼-in. Winchester disk, a 20M-byte, ¼-in. tape cartridge and three RS-232 ports said to support transmission rates of 19.2K bit/sec.

The floor version is enlarged by a 30M-byte Winchester disk and 11 ports.

The desktop computer costs $13,695; the floor model sells for $24,395.

Both versions are available from Bantam, which is located at Suite 1200, 6033 W. Century Blvd., Los Angeles, Calif. 90045.

Compatible With IBM 370

STC Rolls Out Optical Disk

By Jim Bartimo
CW Staff

LOUISVILLE, Colo. — Boasting 4G bytes of storage and transmission rates of up to 3M char./sec, Storage Technology Corp. (STC) has released a nonerasable optical disk storage system said to be fully compatible with IBM 370, 4300 and 30 series processors running under the MVS/SP 1.3 operating system.

The 7600 Optical Storage Subsystem consists of a 7640 Optical Storage Unit, a 7440 Optical Media Unit (optical disk), an 8880 Storage Control Unit and Opsam software said to allow a host CPU to write data to an optical disk and retrieve the data as necessary.

Each optical platter will store four billion characters, which is the equivalent of two million pages of double-spaced, typed information. The Optical Media Unit has a reported life of 10 years.

"The STC release will be one of many optical disk systems on the market in 1984," according to Ken Bosomworth, president of International Resources Development, Inc. "Magnetic disks will be the dominant technology for small amounts of data, but optical disks will push magnetic disks out completely for large applications."

The Optical Storage Unit accepts interchangeable optical disks and uses a technology of coherent light from two lasers — one records a code on the disk that is read by the second laser as data for the host CPU. Error detection is said to provide the user with only one possible error in 312 disks or 10 trillion bits.

(Continued on Page 76)

Canaan Computer Corp.'s single-user workstation

Risk Management System Announced by Comtec

SOUTHFIELD, Mich. — Comtec, Inc. has announced a turnkey risk management system said to address all major risk management functions.

Risk Master reportedly allows the user to enter and analyze data for four major modules: general claims ($1,750), workmans' compensation ($1,750), incidents ($3,000) and medication-error tracking ($1,000). A fifth module, Sortmaster, allows the user to create and define detailed ad hoc reports using a step-by-step menu process.

The turnkey system allows users to respond immediately to management requests, determine trends, pinpoint problem areas and foresee potential problems. The software runs on IBM, Honeywell, Inc., Prime Computer, Inc. and Digital Equipment Corp. computers using Pick & Associates, Inc.'s Pick operating system, the vendor said. Also, Risk Master is reportedly fully operational on the IBM Personal Computer; an IBM XT version is also available.

The four main modules are available individually or as a complete package for $7,500. Sortmaster costs $1,500 and is not optional. Comtec is located at 28366 Franklin Road, Southfield, Mich. 48034.

Canaan Workstation Boasts Mainframe Power

By Patricia Keefe
CW Staff

TRUMBULL, Conn. — Canaan Computer Corp. has announced what it calls the first of a new generation of networkable, single-user workstations that offer mainframe power and run IBM 370 VM/CMS programs.

According to the vendor, the system is designed to put "mainframe-class" computing power into the hands of end users who are dependent on a centralized mainframe, but are getting inadequate response and capability and want to run IBM 370 software.

The system is also designed to be purchased as an alternative to time-sharing.

Canaan's target market is the Fortune 1,000 IBM 370 time-sharing users, plus the largest financial and insurance organizations.

The Canaan computer is built around an operating system that not only provides access to the extensive body of 370 software — including 370 VM/CMS applications — but also provides access to a host of capabilities reportedly not available in 370-class mainframe systems. These include integrated graphics, multiwindowing display, multiprocessing, concurrent processing and high-speed interaction. The op-

(Continued on Page 76)

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Workstation Runs IBM Programs

(Continued from Page 75)

erating system also is said to feature a built-in Ethernet local-area network system that allows communications to shared resources.

The Canaan machine communicates with other computers and peripherals via a high-speed, 10M bit/sec channel. When communicating, the system operates in a peer network, reportedly avoiding the restrictions of traditional master/slave configurations. Other technical specifications include:

- A 32-bit proprietary processor that executes 370 VM/CMS software in machine language and communicates and shares resources with other Canaan workstations via Ethernet — reportedly without degrading system speed — and a separate processor that performs all I/O functions, including device control, file management and network access.
- A two-bus system architecture — a 32-bit main bus supports the main processor and main memory, speeds program execution and data transfer, while a 16-bit multibus supports peripherals and network and increases throughput.
- A 1M-byte error-correcting main memory, expandable to 4M bytes.
- A very high-resolution, bit-mapped CRT display (1,024 pixels by 768 pixels), with detached keyboard and full graphics controller.
- Automatic self-diagnosis to isolate problem components and an automatic problem diagnosis dial-up modem for remote service and system upgrades.

Options include a 35M- to 140M-byte Winchester disk, 200 or 400 char./sec dot matrix printers, an IBM-compatible ½-in. tape drive and an additional very high-resolution display and keyboard, the vendor said.

Since access to IBM 370 application software is said to be the primary ingredient of Canaan's marketing strategy, the vendor has an ongoing program of evaluating and certifying third-party software. According to the vendor, three fourth-generation management systems have already been certified: Information Builders, Inc.'s Focus; D&B Computing Services' Nomad2; and Mathematica, Inc.'s Ramis 2. Currently, the only package available for licensing on the Canaan system is Focus, which starts at $6,500 for the first single-user workstation.

In a typical network of six nodes with shared peripherals, the average price will be about $35,000 per node. Plans are to introduce a two-user node later this year, further reducing the cost per unit, Canaan said from 39 Linderman Drive, Trumbull, Conn. 06611.

CAD Unit Based On HP Micro

SCOTTS VALLEY, Calif. — Avera Corp. has introduced a computer-aided design (CAD) engineering-workstation built around Hewlett-Packard Co.'s 32-bit microprocessor.

Designated the EDS-2100, the system is intended to support the engineering of integrated and hybrid circuits and circuit boards.

The workstation runs schematics and layout design software along with analysis packages. It has a Tektronix, Inc. 19-in. display, the Model 4115B.

The workstation costs approximately $100,000 and will be available in January from Avera, 200 Technology Circle, Scotts Valley, Calif. 95066.

STC Unveils Storage System With 4G Bytes

(Continued from Page 75)

The disk is a 14-in. coated aluminum platter in a protective cartridge that is automatically removed during loading into the storage unit. The disk is then placed on a high-speed spindle and raised into position under the optical head which contains the read-and-write lasers, a vendor spokesman said. It can be written to or read from at 3M char./sec.

The Opsam executes IBM's MVS/SP 1.3 operating system and converts commands from the controller to drive the correct action and responses in the storage unit.

The storage system can also include programmable channel switches said to allow a properly configured 8880 control unit to direct data operations over a combination of one to 16 channels, increasing storage availability and data throughput.

List purchase price for the 7640 is $130,000 with a lease rate of $3,785/mo on a 36-mo basis. The 8880 Storage Control Unit, which can have either two or four storage directors, is available immediately for $65,000. The 7440 media unit is available for $140 to $225, depending on quantity. The Opsam software is licensed to 7600 users for an installation charge of $1,000 and a monthly fee of $400. A distributed system license option is available for an installation charge of $750 and a monthly fee of $300, according to the vendor.

Shipments to end users will begin in the second quarter of 1984, and the disks and storage units will be available through OEMs.

More information is available from STC, 2270 S. 88th St., Louisville, Colo. 80028.

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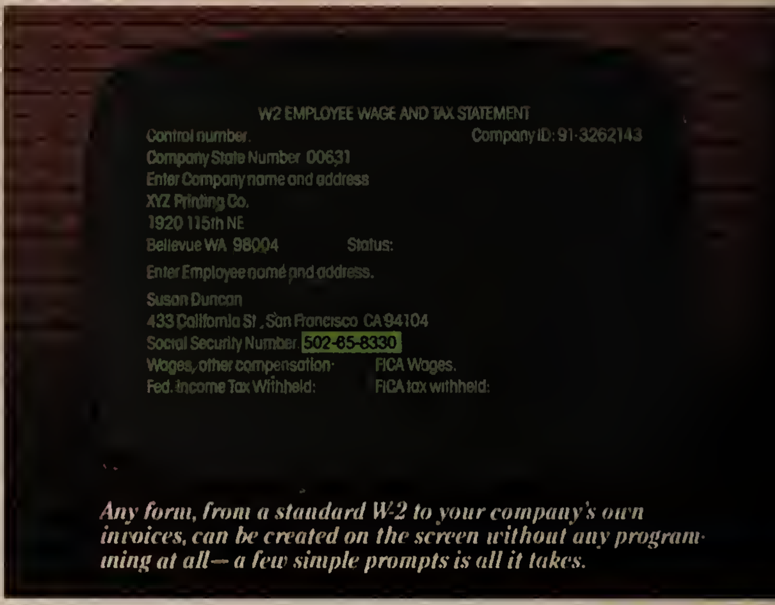

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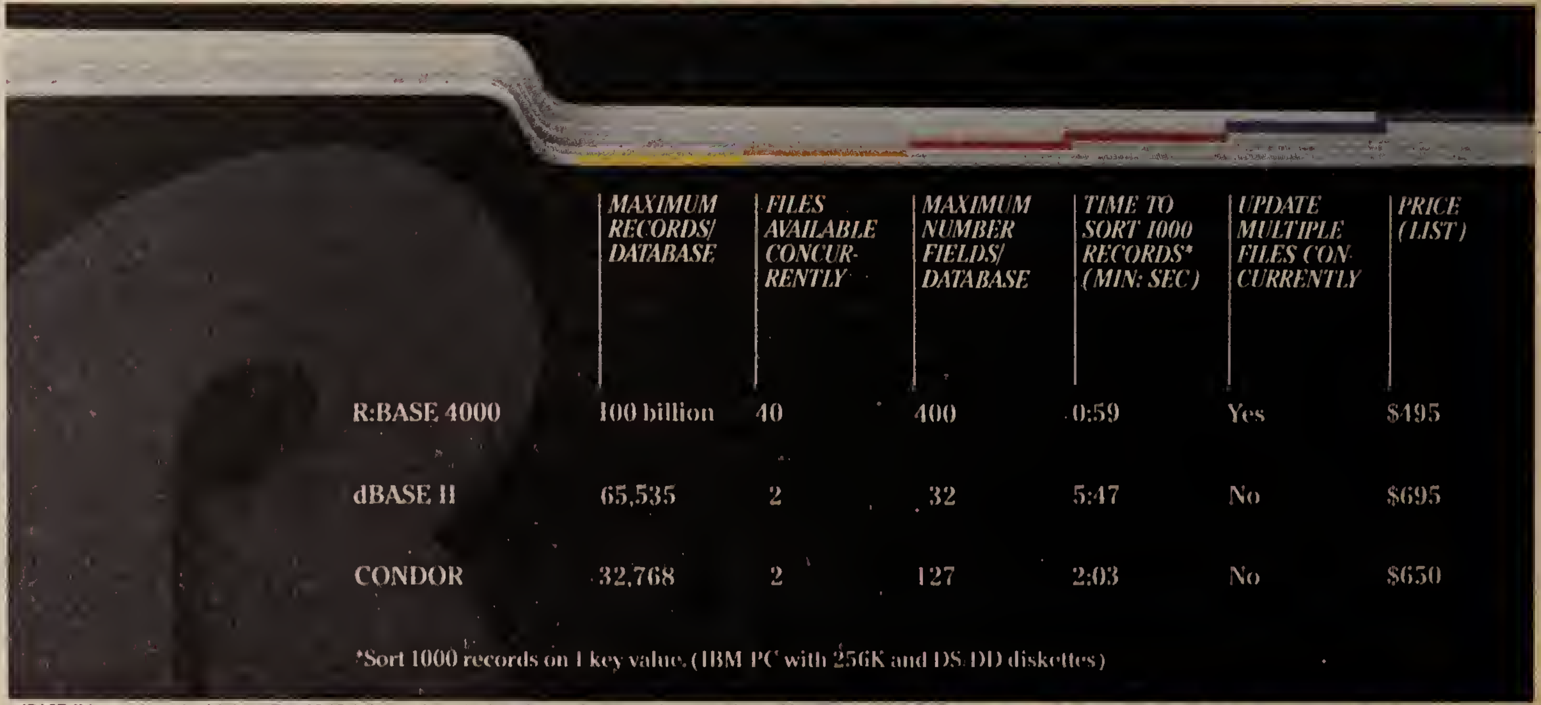
As you become more proficient, you'll create shortcuts by customizing menus of stored commands. And print reports as simple or complex as you like at the touch of a key. With R:base, prompted, ad-hoc queries and customized report formatting become the reality that first generation products could only promise!

R:base is also very forgiving. It's very hard to make a mistake. That's because commands are simple English expressions—like SELECT, PROJECT, WITH, WHERE, FROM, etc. Dates and dollar amounts are written normally: 11/16/83;



	MAXIMUM RECORDS/ DATABASE	FILES AVAILABLE CONCURRENTLY	MAXIMUM NUMBER FIELDS/ DATABASE	TIME TO SORT 1000 RECORDS* (MIN: SEC)	UPDATE MULTIPLE FILES CONCURRENTLY	PRICE (LIST)
R:BASE 4000	100 billion	40	400	0:59	Yes	$495
dBASE II	65,535	2	32	5:47	No	$695
CONDOR	32,768	2	127	2:03	No	$650

*Sort 1000 records on 1 key value. (IBM PC with 256K and DS/DD diskettes)

dBASE II is a trademark of Ashton-Tate. VisiCalc is a trademark of VisiCorp. 1-2-3 is a trademark of Lotus. MultiPlan and MS-DOS are trademarks of MicroSoft. CTOS is a trademark of Convergent Technologies. Unix is a trademark of Bell Labs.

Redshaw's Micro Functions as Workstation

PITTSBURGH, Pa. — Redshaw, Inc. has made available a new Professional Computer, manufactured by Wang Laboratories, Inc., which will function as a workstation on the Redshaw Comprehensive System for the insurance industry, a software and hardware package utilizing the Wang 2200 minicomputer.

The Professional Computer, which the company said is designed for office rather than home use, will allow Redshaw System users to take advantage of software packages offered by insurance companies and other software suppliers.

The Professional Computer is based on the Intel Corp. 8088/6 microprocessor, using Microsoft, Inc.'s MS-DOS operating system. A spokesman said that because this is the same microprocessor and operating system utilized by the IBM Personal Computer, most software currently written for the IBM system will be compatible with the Redshaw Professional Computer.

According to the company, the Professional Computer is designed for office and word processing use and features a keyboard with 32 special function keys. The system uses a 16-bit internal data bus and operates at a higher cycle speed, allowing it to run comparable programs faster.

The Professional Computer is priced at $5,200, Redshaw said from 103 Yost Blvd., Pittsburgh, Pa. 15221.

Adviser K-Series Gets High-End Addition

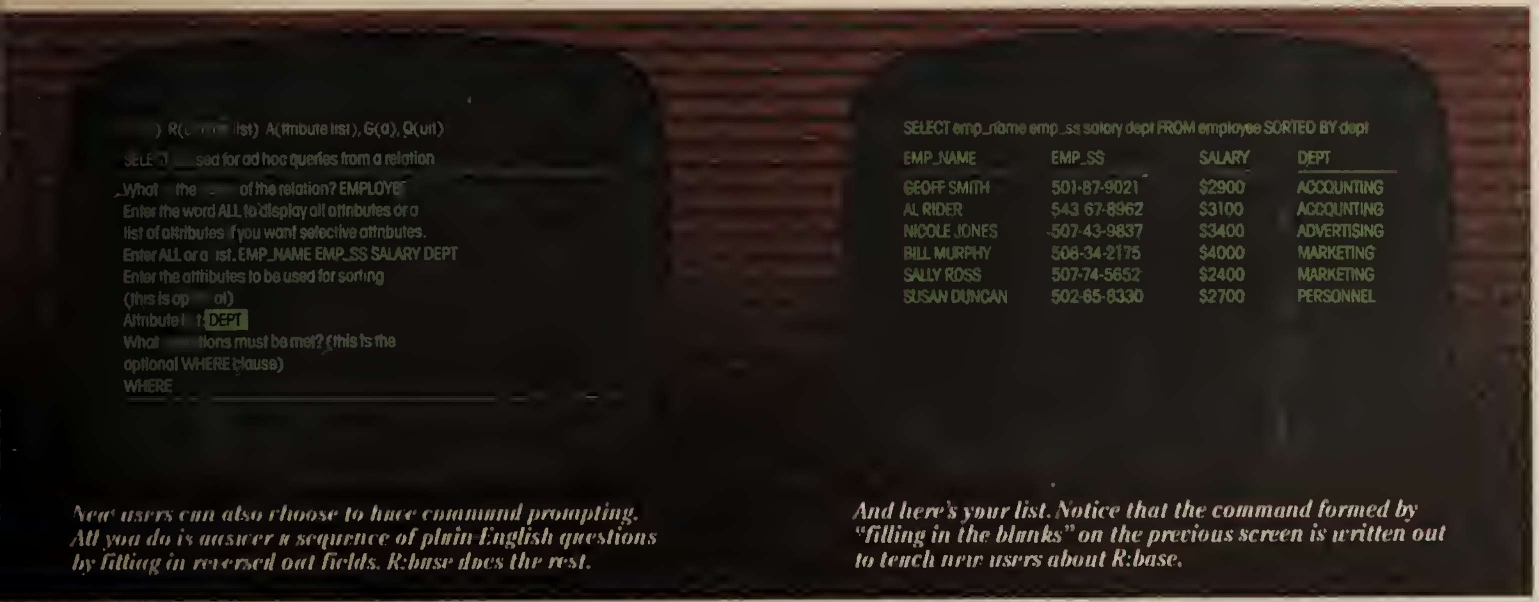
MINNEAPOLIS — Computer Designed Systems, Inc. has announced a high-end addition to its Adviser K-Series of minicomputers which the company said is 40% faster and stores 35% more than IBM's System/38.

The line, which makes use of report generators and source code generators, is described as "extremely user friendly" and is designed for manufacturers, medical users and wholesale distributors requiring fast terminal response.

The system runs spreadsheet programs such as Visicorp's Supercalc or Visicalc, a spokesman said. Users may add word processing and text editing modules as well as several thousand application programs. The K-Series computers are said to be upward-compatible with existing Adviser hardware and software.

The K-Series computers are priced between $140,000 and $1,200,000. Information can be obtained from Computer Designed Systems, 10911 Olson Memorial Highway, Minneapolis, Minn. 55441.

PURCHASING dBASE II™, THIS FIRST.



```
) R(     list) A(ttribute list), G(o), Q(uit)
SELE     sed for ad hoc queries from a relation
What   the      of the relation? EMPLOYE
Enter the word ALL to display all attributes or a
list of attributes if you want selective attributes.
Enter ALL or a  ist. EMP_NAME EMP_SS SALARY DEPT
Enter the attributes to be used for sorting
(this is op     al)
Attribute l  t: DEPT
What       tions must be met? (this is the
optional WHERE clause)
WHERE
```

New users can also choose to have command prompting. All you do is answer a sequence of plain English questions by filling in reversed out fields. R:base does the rest.

```
SELECT emp_name emp_ss salary dept FROM employee SORTED BY dept
EMP_NAME       EMP_SS        SALARY   DEPT
GEOFF SMITH    501-87-9021   $2900    ACCOUNTING
AL RIDER       543 67-8962   $3100    ACCOUNTING
NICOLE JONES   507-43-9837   $3400    ADVERTISING
BILL MURPHY    508-34-2175   $4000    MARKETING
SALLY ROSS     507-74-5652   $2400    MARKETING
SUSAN DUNCAN   502-65-8330   $2700    PERSONNEL
```

And here's your list. Notice that the command formed by "filling in the blanks" on the previous screen is written out to teach new users about R:base.

$500.00. And, because data entry verification rules are defined up front, you just can't put any "garbage in"—even if you try!

What's more, R:base allows you to sort and select data on up to ten different criteria, perform totals, and then display the results—all with a single, powerful command (see screens).

QUESTIONS? ASK FOR HELP.

The R:base HELP feature provides detailed information that describes every command and process required for complete mastery of the database. (As does our plain-English documentation.) For example, if you're not sure what SELECT does, simply key in HELP SELECT and R:base will tell you what the command does, how it works, even the proper syntax. This way you don't have to keep referring back to the user manual—it's all right there in front of you.

R:base + MULTIPLAN™ = POWER²

Unlike first generation microdatabases offering the "amazing" capacity of one file and some 60,000 records, R:base literally blows the lid off database size. You may never create an application using forty files with 100 billion records. But with R:base, you can.

Now imagine being able to tap all that power in conjunction with one of the most popular spreadsheet programs on the market today: MultiPlan. R:base is fully compatible with MultiPlan, so you can zip back and forth between programs without cumbersome file manipulation.

THE R:base PRODUCT FAMILY.

R:base™ 4000 is a single-user relational database (MS-DOS™ version is list $495). R:base™ 6000 is a multi-user version, available early 1984. In addition to MS-DOS, both packages will also be available in CTOS,™ with UNIX™ to follow.

The optional extended ReportWriter™ provides enhanced reporting and calculating capabilities (MS-DOS version is list $150). Program Interface™ is a set of subroutines which allows direct database access from PASCAL or FORTRAN programs (MS-DOS Version is list $395).

And what happens if you've already got dBASE 1l? Not to worry. It's easy to transfer your files to R:base.

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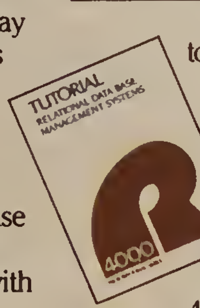

Many computer professionals think R:base sounds too good to be true. Actually, it's even better.

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ESC Announces Design Graphix For CAD Users

BATON ROUGE, La. — Engineering Systems Corp. (ESC) has announced a three-dimensional computer-aided design and drafting system that provides basic geometry, automatic utilities and bill of materials, symbols from user-definable menus, 16 possible pens and 16 layer functions.

According to an ESC spokesman, Design Graphix allows users to take advantage of Rapid, the system's high-level programming language, to include calculations and special commands in the drafting process.

The system also offers Teach, an on-line programmed course, plus the Help facility to assist in-house operating personnel.

Design Graphix can operate on micros and minicomputers as a stand-alone system or as a workstation attached to a larger computer. The system supports a large range of peripherals, including graphics displays, digitizers, plotters and magnetic tape, and can expand to meet future user needs.

Software for a complete Design Graphix system is priced under $10,000. More information is available from ESC through P.O. Box 80318, Baton Rouge, La. 70898.

Power System Targets Desktops

DALLAS — Bits Power Systems, Inc. has announced a portable, self-contained uninterruptible power system that can be used with most desktop computers.

The 115V, 60Hz isolated output reportedly protects computer operations against utility gaps, spikes, surges, noise, brownouts or complete outages. Backup or portable operating time ranges from five hours at 25W to one hour at 100W, the vendor said. Input power is switch-selectable for either 115 or 230 Vac, 50Hz/60Hz for worldwide application. A 12-Vdc power cord is included, a spokesman said.

Model Pups-AC is available through computer dealers only and costs $495. Bits Power Systems is located at Suite B114, 11020 Audelia Road, Dallas, Texas 75243.

Provide for Data Collection

Caere Introduces Bar Code Scanners

LOS GATOS, Calif. — Caere Corp., maker of optical character recognition (OCR) systems, has introduced a family of bar code scanners enabling the user to provide a broad range of automated data collection.

The Caere 200 series bar code scanner is able to provide the speed and accuracy of bar code scanning to users of the IBM Personal Computer, minicomputers, serial terminals and IBM 3278-type terminals with a simple computer interface, the company claimed.

According to the vendor, the bar code scanners and OCR readers offer an alternative to the standard keyboard data collection that allows the user a higher level of data entry control.

The bar code scanners provide interface to most industrial and administrative CRT serial computer terminals and to synchronous data link control displays. The bar code scanners are easily adaptable to harsh environment applications like inventory and shop-floor control, document tracking and accounting procedures, according to the vendor.

Minicomputers, serial terminals and most personal computers are interfaced through an available RS-232C port by the Caere 212 Dual Serial Bar Code Scanner, a spokesman explained. The Caere 240 PCscanner provides the user of the IBM Personal Computer or Personal Computer XT an integrated board that is a program-transparent keyboard interface.

Users of terminals such as the IBM 3278 and 3178, the Memorex Corp. 2078, the Telex Computer Products, Inc. 278 and the IBM 5251 are supported by the scanner's program-transparent keyboard interface as well. In addition, users of the Personal Computer and 3278-type equipment can add Caere's bar code scanners to applications without changing the existing software.

The Model 240 scanner for the IBM Personal Computer is priced at $745. An optional program to print bar code on the IBM Personal Computer or Personal Computer XT is offered for $179. Model 212 scanners for minicomputers, serial terminals and personal computers are priced at $789, while the 220 Bar Code Keyboard Scanner is $944.

The 240 and 212 models will be available at the end of October; the 220 will be ready one month later.

More information is available from Caere at 100 Cooper Court, Los Gatos, Calif. 95030.

Plessey Matrix Printer Boasts Letter-Quality Capability

IRVINE, Calif. — Plessey Peripheral Systems, Inc. has introduced a low-cost matrix printer with correspondence-quality capability.

The Plessey Model LCQ50, manufactured by Texas Instruments, Inc., contains a standard Ascii character set plus seven additional international character sets in a desktop printer.

It has 24 font combinations including standard, compressed, double-wide, enhanced, double-strike and emphasized. The printer also supports raster and mosaic graphics and is compatible with both serial and parallel interfaces.

Model LCQ50 operates at 150 char./sec in the draft mode or at 90 char./sec in the enhanced mode. The bidirectional LCQ50 supports 80 standard characters per line or 132 compressed.

Six or 8 line/in. may be specified. A 256-char. receive buffer is also standard, with an option of upgrading to a 4,000-char. buffer with X-on and X-off.

The printer, available immediately upon receipt of order, is priced at $535. More information is available from the vendor at 2632 Du Bridge Ave., Irvine, Calif. 92714.

Disk Controller Can Handle Four Drives

MINNEAPOLIS — Ciprico, Inc., a supplier of multibus disk and magnetic tape controllers, has introduced a high-performance storage module drive disk controller called the Rimfire 50.

The Rimfire 50 controls up to four disk drives and incorporates features such as 48-bit, dual-function error correction code with 16-bit correction, 8- and 16-bit data bus operations, 16K bytes of programmable read-only memory, 32K bytes of optional buffer random-access memory, 24-bit addressing, 2 MHz direct memory access (DMA) transfer rate and 1:1 interleave and generates up to two independent interrupts.

According to the vendor, the Rimfire 50 has the "power and flexibility of the Intel [Corp.] 80186 and the dual-DMA 80186." Two independent DMA devices, one internal to the 80186 and one discrete, can transfer data simultaneously from the disk to the buffer and from the buffer to the system memory, enabling disk interleave of 1:1.

Another feature of the Rimfire 50 is the attach command allowing the user to establish communication with another system peripheral controller.

The price for small quantities of the disk is $1,606. More information is available from the vendor at 2405 Annapolis Lane, Plymouth, Minn. 55441.

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Seminar:
How to automate system development.

Automatic System Facility

Seminars on Cullinet's IDMS/R with Automatic System Facility, and their entire line of software products, will be held in the following cities during the coming weeks.

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Allentown, PA	October 12
Anchorage, AK	October 20
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Bridgeport, CT	October 13
Champaign, IL	October 12
Chicago/Oakbrook, IL	October 13
Columbus, GA	October 12
Denver, CO	October 11
Edmonton, ALTA	October 13
Halifax, NS	October 13
Huntsville, AL	October 12
Jackson, MS	October 13
Little Rock, AK	October 14
Moncton, NB	October 12
New York, NY	October 12
Phoenix, AZ	October 12
Portland, ME	October 12
Raleigh, NC	October 13
Richmond, VA	October 11
Roanoke, VA	October 12
San Jose, CA	October 18
Syracuse, NY	October 20
Tulsa, OK	October 11
Wilmington, DE	October 18

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Their way.	Our way.
1. Specify Data Element	1. Specify Data Element
2. Define Database	
3. Create Screen Formats	
4. Develop Applications to A. Populate B. Modify C. Delete D. Retrieve	
5. Link Definition, Screen and Application Together	
6. Document The System	

IDMS/R Automatic System Facility.

One database management system provides an Automatic System Facility for system development: IDMS/R.

Fourth generation languages, though excellent productivity tools, only address part of the system development task – namely, steps three and four as shown above. IDMS/R with Automatic System Facility, however, automates all of the steps necessary to develop systems. All you do is specify the data.

The Automatic System Facility dynamically builds the system.

It defines the database; creates screen formats; develops the applications; links the definition, screen and application together, then documents the system.

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IDMS/R.

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- Will Zachman, VP,
  Technology Assessment, IDC
  "Microprocessor Impact on Systems and Uses"
- Dr. Howard Frank, President,
  ConTel Information Systems, Inc.
  "Local Networks: Before You Get One"
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  Advanced Office Concepts
  "Solving DP/WP Integration Problems"
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  Mitchell & Horrell, Inc.
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ADC Associates

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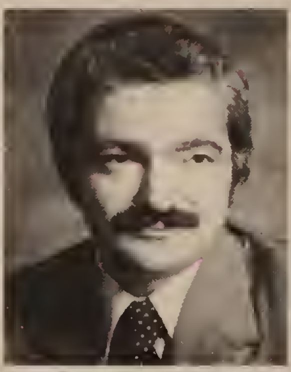
Dr. Howard Frank, President
Contel Information Systems, Inc.

Dr. Howard Morgan, Chairman
Advanced Office Concepts

Harry Newton, President
The Telecom Library

Conferences

Professional seminars and discussions concerning state-of-the-art-technologies will be led by the foremost experts in the field. It is the first time so many of the best and most renowned industry speakers will be gathered together under one roof to discuss the integration of communications, office automation and data processing.

Over 35 *General Sessions* will be presented by professionals with 'hands-on' experience — professionals who have actually lived through the experience tell their stories and offer suggestions and solutions.

Here's a sampling of the general session topics:

- *"Satellite Networks"*
- *"Network Intelligence"*
- *"The Multifunction Workstation"*
- *"Pilot Projects: Corporate PC Acceptance"*
- *"MIS — OA: Resolving the Conflicts"*

Edmund B. Fitzgerald, President of Northern Telecom, Ltd. will speak on "Business Integration — the Vision and the Reality."

first conference & exposition office systems integration.

Keynote Speaker: John Diebold — internationally acknowledged expert and founder and chairman of the Diebold Group, Inc. Mr. Diebold will speak on "Integration: A Corporate Effort."

Exhibits

There will be over 400 exhibits by leading information companies with the latest vendor architecture and technologies available. Special time is set aside for conference attendees to view all the exhibits and talk first-hand to the vendors.

Here are just some of the fine companies you can expect to see exhibiting at INTECH '83: Apple Computer, Inc., Applied Data Research, Inc., AT & T Information System, Inc., Computer Automation, Cullinet Software, Inc., Data General Corporation, Datapoint Corporation, Digital Equipment Corporation, Exxon Office Systems, Inc., Grid Systems Corporation, ITT World Communications, Inc., Lanier Business PRoducts, Inc., Lee Data Corporation, NCR Corporation, Prolink Corporation, and Telautograph Corporation.

Exhibit hours are 12:00-6:00 p.m. Tuesday, 10:00 a.m.-6:00 p.m. Wednesday, and 10:00 a.m.-5:00 p.m. Thursday.

In-Depth Tutorials

On October 31 some of the nation's leading consultants take the platform for a full day's formal instruction. These four concurrent in-depth tutorials include lecture notes, lunch and a reception with the speakers.

A — *"Corporate PC Management"* —
Dr. Michael Hammer, Hammer & Co.

B — *"Advanced CBX Applications"* —
Edward Horrell, Mitchell & Horrell

C — *"Local Area Networks"* —
Dr. Ken Thurber & Dr. Harvey Freeman, Architecture Technology Corp.

D — *"Strategic OA Planning"* —
Dr. John McQuillan, McQuillan Consulting

Each of these tutorials promises to provide a hard-hitting look at areas that are essential to the success of every information systems oriented executive.

Invest in "In-Depth"

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To register, or for more information, call Louise Myerow, Registration Manager, *toll-free 800-225-4698* (in Mass., call collect 617-879-0700). Or return the coupon below.

REGISTER NOW!

Please return coupon to:
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☐ Yes! Register me for INTECH '83.
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Conference Fees:

☐ Full three-day conference & exposition (after September 20 — $395.)	$360.
☐ One-day conference & exposition Circle one: Tuesday Wednesday Thursday	$195.
☐ Monday "In-Depth" Tutorial (includes lunch) Circle one session: A B C D	$295.
☐ Four days: includes three-day conference & exposition plus tutorial (after September 20 — $645.)	$595.
Total:	____

INTECH '83 is sponsored by National Trade Productions, Inc. with conference program coordinated by the Conference Management Group of CW Communications/Inc.

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Professionals on the move in today's productivity-paced business environment have to run a little faster just to keep up.

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Give them the powerful 9 pound, 16-bit computer that works when and where they do.

Give them an advanced battery-powered printer that attaches securely on the computer.

Give them an interactive human interface and operating environment that takes only 15-30 minutes to learn.

And unique field-oriented software that comes in rugged plug-in capsules.

In short, give them the Gavilan™ mobile computer.

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Never has there been a complete business computer system as sophisticated, yet as lightweight, as the Gavilan.

Self-contained, rechargeable 8-hour batteries free the user from external power constraints.

The 8 line X 80 character screen eliminates the need for an external monitor, although you can add one if you wish.

The full-size typewriter keyboard makes data entry as convenient as it is in desktop systems.

A built-in 3½" microfloppy disk drive and modem provide the capabilities of data handling and transmission where they never before existed.

And a 50 character per second printer gives the mobile professional in the field the immediacy of hard copy text, forms, charts, spreadsheets and graphics.

All in a compact 14 pound mobile office.

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The success of any computer depends in part on the "friendliness" and accessibility of the user interface.

Especially in the field.

A standard mouse interface is fine for the expanse of a desktop, but not for work on the move.

So with the Gavilan, we incorporated a built-in touch panel: the first fully integrated computer mouse.

It's a pressure-sensitive pad just above the keyboard. Finger movements across the touch panel control the on-screen movements of a cursor.

But like a mouse, the Gavilan touch panel actually executes virtually all of the user commands, saving the keyboard for typing only.

Through the touch panel, users store and retrieve data. Cut and paste. Move documents. Scroll through pages of information. Zoom out for a complete look at the format of a document. Or even ask the computer what just happened and what to do next. With one finger.

SOFTWARE IN A CAPSULE.

The intuitive ease of talking to the computer through the touch panel is made possible by the unique Gavilan operating environment and software packages.

The applications packages come in durable capsules called CapsuleWare.™ They plug directly into the body of the computer, adding no additional volume. The operating software, (GO System™) then lets each of the applications communicate with each other through a common interface and a sharing of data.

The result is a completely integrated information environment that lets the user combine spreadsheets, graphics and word processing text together.

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OUTWARD MOBILITY FOR USERS, UPWARD MOBILITY FOR OEMs.

The Gavilan mobile computer and its CapsuleWare programs are creating vertical market demands—both in MS/DOS and the Gavilan operating environment—for software packages completely unrealized one short year ago.

That means new opportunities in applications development far beyond the typical office-bound programs. From air and sea navigation to banking services. Journalism to field auditing. Anthropology to insurance.

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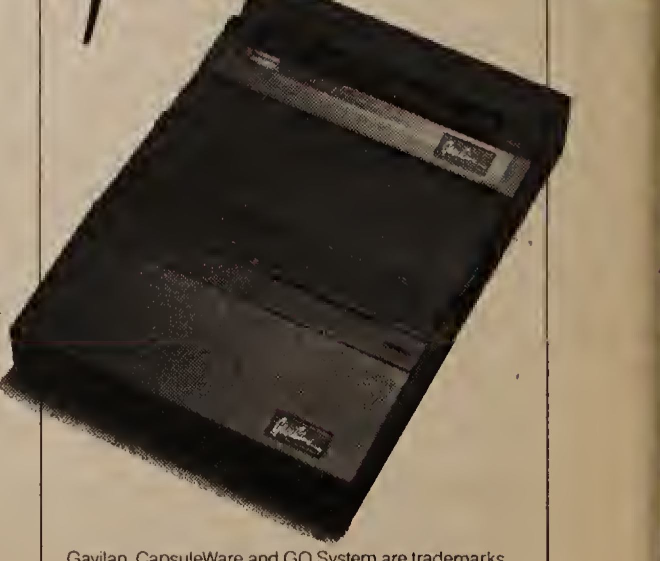

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Increased Volume Cited

IDT Cuts Cost of Tape Transports

SAN DIEGO — Innovative Data Technology, Inc. (IDT) has announced a 15% price reduction on its Series 1050 IBM/Ansi/Ecma industry-compatible, ½-in. nine- or seven-track tape transports and interface peripherals, which prior to the price cuts ranged in price from $4,200 to $10,000.

The reduction is due to increased volume and state-of-the-art production, the vendor said. Included in the price reduction are all models of the TD-1050 series, including the associated systems interfaces for the following mini and micro business computers: Digital Equipment Corp.'s PDP-11, LSI-11 and VAX-11; Intel Corp.'s Multibus; Texas Instruments, Inc.'s Model 990; Centronics Data Computer Corp.'s Port; IBM's Personal Computer or Personal Computer XT; and Apple Computer, Inc.'s Apple II or III.

IDT is located at 4060 Morena Blvd., San Diego, Calif. 92117.

SDSystems Introduces Controller

DALLAS — SDSystems, Inc. has introduced its VFW-III peripheral controller for the IEEE-696 (S-100) bus.

The VFW-III is a single-board controller for floppy and Winchester disk drives that complies with the IEEE-696 standard. The board supports simultaneous use of up to three 5¼-in. Winchester drives and four 5¼- and 8-in. floppy drives in any combination.

The Winchester interface is the ST506/412, which allows systems integrators to select Winchester drives from the majority of manufacturers. Floppy drives may be single- or double-sided and single- or double-density.

The VFW-III is a multilayer card with full power and ground planes. It includes variable-length sector buffers and direct memory access or programmed I/O control. Floppy disk operations include a phase-lock-loop data separator and write-logic software.

The VFW-III is priced at $895. More information is available from the vendor through P.O. Box 28810, Dallas, Texas 75228.

Firm Unveils Printer Line

PHILADELPHIA — Scriptomatic, Inc. has introduced three dot-matrix printers compatible with the company's Scriptomatic Addressing Computer (SAC I).

The model 280 is an 80-col, bidirectional printer that prints 120 char./sec. The model 281 is a 136-col printer, also at 120 char./sec. Model 282 is a 136-col printer rated at 200 char./sec.

All three low-profile printers are designed to operate with the SAC I, and when combined with a Series 300 Labeler any of the printers forms a complete addressing system.

The models are priced at $695 for the Model 280, $1,095 for the 281 and $1,695 for the 282. More information is available from Scriptomatic at 1 Scriptomatic Plaza, Philadelphia, Pa. 19131.

New Printers for IBM Displaywriter

VERY-LOW-COST/VERY-HIGH-SPEED MATRIX PRINTER delivers fast rough drafts and data processing reports at 200 CPS. Complements your IBM printer.

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NCP Smart Box I - the Displaywriter printer interface emulates IBM 5218 Printer. It requires no hardware or software changes to attach these printers to the Displaywriter main printer port number 0.

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The MVP offers you that same dependability for microcomputers. With the MVP's unique Hammer-Bank technology, there's no need to change print wheels or adjust character registration. When other printers are ready to break down, the MVP's just warming up. It's the only microcomputer printer built to take the pressure of high-duty cycle processing. Backed by the meanest mean-time-between-failure rate in the industry.

And the MVP hammers home superior print quality, producing crisp, uniform dots that overlap to form characters so solid, they're clear to the last copy of a multi-part form.

With selectable speeds, the MVP is truly the *most versatile printer.* Capable of "shifting gears" to give you just the output you need—from high-resolution characters at 80 LPM for word processing to compressed print at 200 LPM.

And using the MVP's flexible graphic capabilities, you can generate an unlimited range of customized logos, labels, bar codes, character sets and even draw your own comparisons—in pie charts, line graphs, 3-dimensional representations and much more.

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For more information, contact Printronix at 17500 Cartwright Rd., P.O. Box 19559, Irvine, CA 92713.

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For Use With Micros

UPS Debut in 200W, 350W Models

SAN DIEGO — Elgar Corp. has announced 200W and 350W uninterruptible power systems (UPS) for microcomputers.

Both models, the SPR 201 and SPR 401, are said to eliminate power line anomalies and to provide a reserve battery power system that can run computer systems for up to 25 minutes.

The models feature simple control panels indicating the condition of the power supply and a warning buzzer that activates when the devices switch to reserve power, a spokesman said. The vendor also said that the battery on a device will be automatically recharged when the normal power supply resumes.

The devices are priced at $645 for the 200W model and $795 for the 350W model. More information may be obtained from Elgar at 8225 Mercury Court, San Diego, Calif. 92111.

Graphics Plug-In Card Fits DEC-Compatible CIT-161

IRVINE, Calif. — CIE Terminals, Inc. has introduced a new color graphics plug-in card for its Digital Equipment Corp.-compatible CIT-161 color terminal.

The CIG-267 combines DEC alphanumeric software commands and the Tektronix, Inc. 4027A color graphics command structure.

The CIG-267's dual DEC/Tektronix personality allows computer-aided design, engineering and scientific designers to use DEC alpha commands (in color) and the 4027A terminal's color graphics capabilities simultaneously.

The CIT-161 color terminal provides designers with a 572-by-480 dot resolution and a 75Hz refresh rate for flicker-free displays. Ansi X3.64-compatible, the terminal has 64 programmable color combinations of its eight primary colors.

The cost of the CIG-267 graphics card list is $1,195; the CIT-161 terminal is $2,595, for a total of $3,790 for the package.

The CIG-267 card will be available next month, according to a spokesman for the vendor.

More information is available from CIE Terminals, which is located at 2505 McCabe Way, Irvine, Calif. 92714.

Bar Code Wand, Decoder Interface to RS-232 Port

MOUNTAIN VIEW, Calif. — A bar code reader wand and decoder that can be interfaced to an RS-232 port are available from Intertelephon USA, Inc.

Using existing light-emitted diodes, photosense and microprocessor-controlled algorithms stored in erasable programmable read-only memory, the decoder interprets the digital output from the hand-held wand upon scanning printed bar codes. Codes currently read and decoded include UPC-A, UPC-E, MSI Plessey, EAN-8, EAN-13, industrial and interleaved, according to a vendor spokesman.

The decoder assembly is available in a stand-alone configuration with enclosure and speaker to alert the operator that the code has been read and transmitted and in two printed-circuit board configurations for mounting within a system, terminal, modem or host computer, a spokesman said.

The bar code reader wand costs $70 in single quantities, while the decoder is priced at $495 from Intertelephon at 1200 Levin Ave., Mountain View, Calif. 94040.

Cache Memory Enhances Units

CLARK, N.J. — Ultimate Corp. has introduced a cache memory enhancement for its Honeywell, Inc. DPS 6-based computer systems.

Designed for use on Ultimate systems that also have the High Performance Processor (HPP) enhancement, the cache memory board contains 4K bytes of high-speed memory and is available as a $7,000 upgrade. The HPP, also available as a field upgrade, is $29,000, a vendor spokesman said.

More information about Ultimate systems is available from the firm at 77 Brant Ave., Clark, N.J. 07066.

ACDC Unwraps Power Supply

OCEANSIDE, Calif. — ACDC Electronics has announced a five-output 500W switching power supply.

Features of the RSF505 include an external 115/230 Vac conversion switch, outputs of 2V to 28V on all channels and wireless submodular construction.

Prices of the power supply begin at $985 from ACDC at 401 Jones Road, Oceanside, Calif. 92054.

Gould Unveils Enhancement To Its Model GSU 3056 UPS

SAN DIEGO — Gould, Inc. has introduced an enhanced version of its 500W rated uninterruptible power system (UPS).

The Model GSU 3056 on-line system reportedly provides continual voltage regulation and noise elimination for personal computers, point-of-sale systems and other sensitive loads as well as battery reserve during complete power outages. In addition, the power system includes an internal 10-min battery, or it can be used with external 48V batteries for periods up to several days, Gould said.

The latest version of the Gould Micro-UPS features line synchronization with slow slew acquisition, table or rack mounting and optional static transfer switch. It measures 5¼- by 17- by 23-in. deep and weighs 75 lbs. Prices start at $1,450 with distributor discounts available from Gould, Power Conversion Division, 2727 Kurtz St., San Diego, Calif. 92110.

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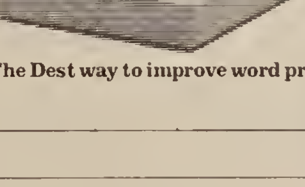

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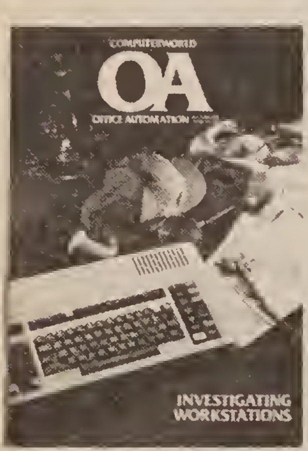
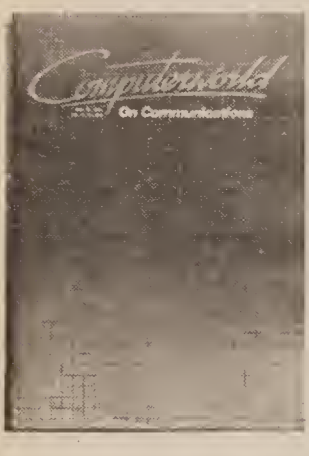
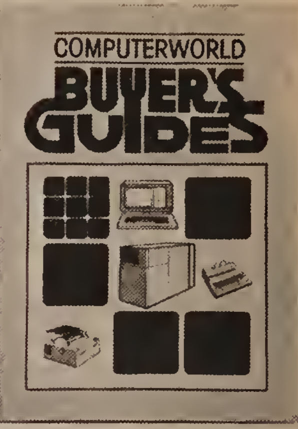


Every two months, *Computerworld OA* gives you a detailed, thoughtful look at all the happenings in Office Automation. Each issue examines a particular area of OA, giving you a complete overview of the state of the art in that area and other aspects of OA. Recent issues have examined overall OA planning Strategies, Workstations, OA Software, Personal Computers, and Management Support Systems.



Our newest publication does for communications what OA does for Office Automation. *Computerworld on Communications* covers the fast-merging worlds of computers and communications with in-depth articles on important trends and current topics. Subjects which have been or are scheduled to be covered in *CW on Communications* in its two 1983 issues include: Voice and Data Communications, Local Area Networks, Communicating Personal Computers, Local Loops, Convergent Technologies, and Telecommunications Management.



Computerworld Buyer's Guides *are* a new type of reference source for the computer-involved professional. *CW Buyer's Guides* are broken down by topic, for easy reference, and include useful articles on that issue's topic, as well as complete company and product listings. With thousands of companies and tens of thousands of products now in the computer market, and new ones becoming available every day, these guides can be an indispensable reference source. Three *Buyer's Guides* are to be produced in 1983: *Computer Systems* (August); *Terminals and Peripherals* (October); and *Software* (November).

Computerworld Extra! is a special, extra issue of *Computerworld* which we publish from time to time in order to give extra attention to an important current topic. Every issue of *Extra!* is devoted entirely to a complete look at a single area of topical importance. Next Extra! is on Microcomputers.

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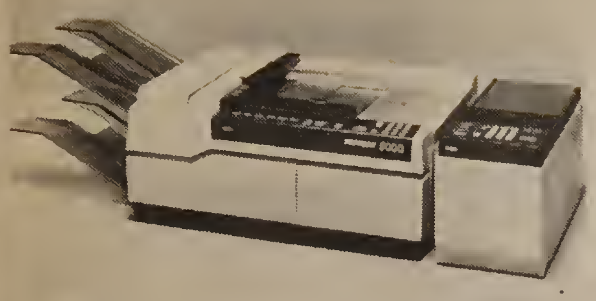
1. BUSINESS/INDUSTRY (Circle one)

End Users
- 10 Manufacturer (other than computer)
- 20 Finance/Insurance/Real Estate
- 30 Medicine/Law/Education
- 40 Wholesale/Retail Trade
- 50 Business Service (except DP)
- 60 Government-State/Federal/Local
- 65 Public Utility/Communication Systems/Transportation
- 70 Mining/Construction/Petroleum/Refining
- 75 Other User______

Vendors
- 80 Manufacturer of Computers, Computer-related Systems or Peripherals
- 85 Computer Service Bureau/Software/Planning/Consulting
- 90 Computer/Peripheral Dealer/Distributor/Retailer
- 95 Other Vendor______

2. OCCUPATION/FUNCTION (Circle one)
- 11 President/Owner/Partner/General Manager
- 12 VP/Assistant VP
- 13 Treasurer/Controller/Financial Officer
- 21 Director/Manager/Supervisor DP/MIS Services
- 22 Director/Manager of Operations/Planning/Administrative Service
- 23 Systems Manager/Systems Analyst
- 31 Manager/Supervisor Programming
- 32 Programmer/Methods Analyst
- 35 OA/WP Director/Manager/Supervisor
- 38 Data Comm Network/Systems Mgmt
- 41 Engr/Scientific/R&D/Tech Mgmt
- 51 Mfg Sales Reps/Sales/Marketing Mgmt
- 60 Consulting Mgmt
- 70 Medical/Legal/Accounting Mgmt
- 80 Educator/Journalist/Librarian/Student
- 90 Other______

3. COMPUTER INVOLVEMENT (Circle all that apply)
Types of equipment with which you are personally involved either as user, vendor or consultant
- A. Mainframes/Superminis
- B. Minicomputers/Small Business Computers
- C. Microcomputers/Desktops
- D. Communications Systems
- E. Office Automation Systems



Rapicom 5000 With SAF-PAK

Rapicom Unveils Facsimile Device With Redialing

FAIRFIELD, N.J. — Rapicom, Inc. has introduced a desktop digital facsimile transceiver said to incorporate broadcast functions via programmable memory.

The Rapicom 5000 is a microprocessor-controlled CCITT Group 3 facsimile device that provides a 9,600 bit/sec step-down modem said to provide transmission speeds of 15 sec/page.

When equipped with the vendor's store-and-forward package, SAF-PAK, the 5000 can also function in networking applications.

The unit offers a 30-page document feeder and storage of up to 100 telephone numbers for autodialing, a vendor spokesman said.

If a remote terminal fails to accept a telephone call from a transmitting 5000, the local unit will initiate two redialing sequences five minutes apart in an attempt to complete document transfer.

The Rapicom 5000 is available for $7,000.

With the SAF-PAK software, it is available for between $9,900 and $11,000. More information is available from Rapicom, which is located at 7 Kingsbridge Road, Fairfield, N.J. 07006.

Flexible Strategy Seen Key To Office of the Future

By Robert Batt

CW West Coast Bureau

SAN FRANCISCO — An essential key to establishing an effective "office of the future" is for information specialists to put in place a viable strategy, according to Joseph Izzo, president of the JIA Management Group, Inc.

Speaking here recently at the Third Annual Conference on Personal Business Computers, Izzo, an expert in the development and implementation of management and control techniques, said companies must immediately address the issues of productivity posed by office automation.

Addressing the issue of how to integrate personal computers into the evolving office of the future, Izzo said it is vital that DP managers and users together develop a flexible, evolutionary strategic plan that allows for experimentation and change and permits the incorporation of new devices.

"With a flexible strategy in place, the probability of success will be very high," Izzo said. "The company will also be on the leading edge of solving the office productivity problem. Without a strategy, there is a high probability of failure . . . in achieving the necessary productivity gains for the business."

The key phrase for office automation is "as need dictates generator." This means that instead of getting information from data processing in a fixed format, which must then be reworked to meet the individual needs of executives, the requirements of executives will dictate the form and content of the information they receive, he explained.

"Executives and their professional support staff will have access to the data base they require to extract, analyze and format information to solve the problem at hand. As the problem changes and pressures mold the issues, [executives] again have easy access to the data base to view new information and perhaps alter their decisions," Izzo said.

Importance of Simplicity

It is important to move toward simplicity in problem solving. Executives want to see a problem, have access to the details relative to it and solve it. "If most companies were to wait for this information from the data processing department, they would have a long wait. They will have lost their competitive edge. Companies must begin immediately to address and resolve the issue of productivity," he warned.

Izzo claimed the problem has been exacerbated by exaggerated claims about the capabilities of personal computers. For example, despite claims to the contrary, there is no communications discipline that allows a broad range of personal computers to work easily or effectively together.

Also, he added, while the personal computer is perceived as a $2,000 to $5,000 expense, as users acquire memory, printers, software and communications links and add the costs of training, a desktop computer can, in reality, cost more than $30,000.

"But personal computers do have their place," Izzo conceded. "They will become just one part of the upcoming, comprehensive, corporate office automation. Rather than attempting to solve the problem of integrating personal computers into existing information networks, companies should focus on a strategy for integrating them into the evolving office of the future," he said.

Philips to Announce Products at Info '83

DALLAS — Philips Information Systems, Inc. will introduce six products aimed at the office automation market at the Info '83 exhibition in New York this month.

Two of the products featured will be the Information Processing System (IPS), a 32-bit supermicrocomputer said to support Philips universal workstations, and the Conversational Management Information System (Comis).

Also to be introduced are: Megadoc, a laser-disk mass storage and retrieval device; the 3005 universal workstation; the 1002 workstation; and a local-area network.

- The IPS will run the Unix System III operating system and permit end-user programming. It is also said to provide capabilities such as shared filing, electronic mail, telex and meetings management. The system will be available at the end of 1984 for between $50,000 and $300,000.
- Comis is a software package developed for IBM and compatible mainframes. It uses the IBM 3270 protocol feature of the Philips universal workstations. The package will be available in the second half of 1984 for $150,000.
- The Philips 3005 series workstation uses an integrated 10M-byte hard disk and can be configured as a stand-alone workstation or clustered with other 3000 series workstations using the Philips local-area network. Available in the second quarter of 1984, the workstation will cost between $9,000 and $15,000.

The Philips 3005 Universal Workstation

- The Megadoc laser-disk system uses advanced digital optical recording technology to provide archival storage and retrieval for very high-volume business applications. Available in the second half of 1984, it will cost between $250,000 and $3 million.
- The Philips 1002 is a device said to provide keystroke capture, editing and text transfer through a communications link. It will be available for between $1,700 and $2,200 in 1984.
- For local-area networking applications, these and other Philips products can be interconnected through the Philips local-area network architecture. The network can be introduced as a twisted pair or a CATV coaxial cable. It will be available for $1,250 per connection in the first quarter of 1984.

More information on these products is available from Philips Information Systems, 4040 McEwen, Dallas, Texas 75234.

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Analysts Say Apple Committed to IBM Link

By Katherine Hafner
CW Staff

CUPERTINO, Calif. — The recent cooling of relations between Cullinet Software, Inc. and Apple Computer, Inc. has prompted speculation over whether Apple's Lisa will be locked out of entry into the IBM mainframe environment.

The response of many industry analysts is a cautious "no."

An April 19 agreement to link the Lisa to mainframe-based corporate data bases through Cullinet's Information Database would have promoted the micro's entry into the IBM environment. The deal came to a standstill after the two companies could not agree on development or marketing strategies for the interface [CW, Sept. 26].

"It's definitely a setback," commented Mayvid Maclay, an analyst at Creative Strategies International, Inc. in San Jose, Calif. "But even if the agreement doesn't work out with Cullinet, Apple is talking to other companies."

"The important thing is that Apple is committed to the capability to communicate with a mainframe," commented Greg Kelsey, an analyst at San Francisco-based Hambrecht and Quist, Inc. "The key is that they plan to do it. And if you look at the communications technology, there's not any great magic to it."

Joan McKay, an analyst at Kidder Peabody, Inc. in New

(Continued on Page 90)

Is Apple's Polish Beginning to Fade?

By Patricia Keefe
CW Staff

Despite expected sales of $1 billion this year, Apple Computer, Inc. has suffered a few bruises, according to some industry analysts interviewed recently.

These analysts are predicting layoffs of up to 600 Apple employees by Christmas and expect the personal computer maker's stock value to take a nose dive in the early part of next year if the layoffs occur.

Apple is beginning to show signs of wear and tear. Following the announcement two weeks ago of a price cut and the unbundling of the firm's top-of-the line Lisa, Apple's stock dropped 8¼ points. So far this year, Apple's stock has plunged from a high of $62 per share in June to a low of $24.25 in the third week of September.

In addition, Apple recently projected a sharp decline in fiscal fourth-quarter earnings over the same period a year earlier, forecasting a profit of $5 million to $8 million vs. the previous year's fourth quarter of $18.7 million.

However, Apple still expects its earnings for the year to exceed 1982 results by 25% to 30%.

Kenneth Bosomworth, president of International Resource Development, Inc., reported rumblings concerning Apple layoffs. Short-

(Continued on Page 90)

The bare light bulbs and exposed I beams (above) will soon give way to a broad expanse of airy showrooms (see sketch) as work begins in earnest at Boscom, an international computer and communications market center on Boston's waterfront. The official "ground breaking" at the converted warehouse was held recently, witnessed by a large crowd of press and city officials and featuring keynote speaker F.G. Rogers, IBM's vice-president of marketing. IBM has agreed to lease over 20% of the Boscom floor space. The facility is one of several such permanent showrooms planned throughout the country.

IBM Seen Leading Pack With Personal Computer

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — IBM will ship 1.2 million personal computer units in 1984, a 45% market share, according to Peter Wright, vice-president at The Gartner Group, Inc.

Speaking at the recent IBM Futures Conference here, Wright, a former financial analyst at IBM, said the personal computer industry will also witness a violent shakeout over the next 18 months, with only

(Continued on Page 92)

CW at IBM Futures

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Analysts Say Apple Beginning to Lose Its Shine

(Continued from Page 89)

term layoffs of 120 people — 40 in the Lisa group and 80 in the Apple IIe group — are likely, according to another industry analyst. Moreover, if Christmas sales are slow, "there is a possibility of up to 600 layoffs," he added, suggesting that Apple is overstaffed.

An Apple spokeswoman denied all reports of layoffs. She suggested analysts might be confused by the recent dismissal of temporary workers in Dallas, who were hired to handle an increase in demand for the IIe. Sales for the IIe have since "flattened out, as expected."

But the decline of what some industry observers call Apple's cash cow (the IIe), mismarketing of the Lisa and stepped-up competition, particularly from IBM, are seen as the primary reasons behind the bruising of Apple. Several analysts pinpointed what they perceive as problems:

- Competition from IBM — Possibly because of a feeling that Apple lacks the necessary resources to compete with IBM, several analysts suggested Apple as a probable merger candidate.
- The Lisa — There is concern that Apple may have "too many eggs in its Lisa basket," noted Charles Newton of Newton-Evans Research Co. Despite an 18% price cut, the Lisa is still too expensive, according to Bosomworth, consultant Marc Rudov of Venture Development Corp. and other analysts. These analysts charge that while the few packages available for the Lisa do not address the needs of small business users, the Lisa has been stymied by the IBM Personal Computer in the corporate environment.
- The IIe and III — Sales are said to be slipping. Most analysts interviewed agreed the two older Apple machines need to be upgraded. Apple is expected to unveil a Lisa-like upgrade for the IIe in January. Plans also include a separate business unit devoted to the Apple III, the spokeswoman said.
- Marketing — Apple is seen as a victim of its own success. It is similar to Osborne Computer Corp. in that it created a market and then failed to understand how that market changed, according to Rudov and other analysts. Rudov recommended Apple abandon its "No. 1 strategy" and start thinking of itself as "No. 2."

Apple Wants IBM Link

(Continued from Page 89)

York, said that while the termination of the agreement is a "minor negative," the recent increase of software development for the Lisa is bound to produce a similar link for the computer, "whether they do it themselves or have somebody else do it. I think it's safe to assume that Apple knows it has to have an IBM link for its computer to be a viable part of a corporate environment," McKay added.

Marc H. Rudov of Venture Development Corp. in Wellesley, Mass., holds a slightly dimmer view of the Lisa's fate. "Cullinet probably figured Lisa was going to go gang busters, then when it didn't, they pulled out," Rudov said.

Apple, however, persists in its optimism for the Lisa's future, insisting that the computer is intended for a different market than the IBM Personal Computer.

"We realize the importance of providing a system solution to users," commented Floyd Kvamme, Apple's executive vice-president of marketing and sales in a recent interview, "but it's important to understand that Apple is fundamentally in the business of making individual people capable of being more productive in their jobs."

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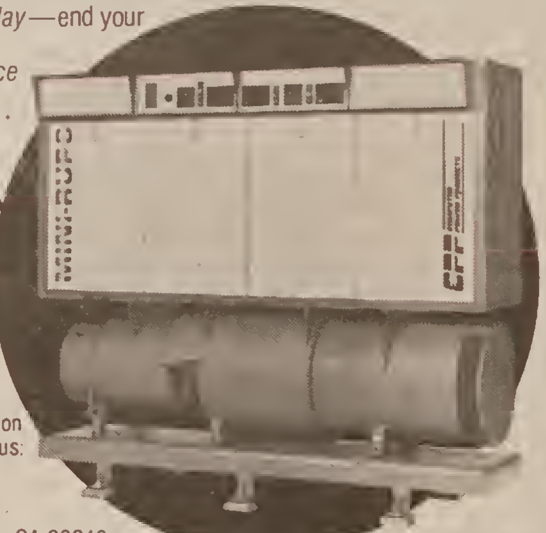

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Semiconductor Industry Warns

Stiffer Export Act Seen Damaging

BOSTON — The Reagan administration's current desire to tighten national security export controls represents a major threat to the U.S. semiconductor equipment and materials industry, executives of that industry told government officials here recently.

At a day-long series of meetings on technology transfer, the Semiconductor Equipment and Materials Institute (Semi) leveled several blasts at representatives from Washington, D.C., including William Schneider Jr., under secretary of state; Frank Knapper, assistant deputy under secretary of defense; and Lawrence Brady, assistant secretary of commerce.

Larry Hansen, executive vice-president of Varian Associates and head of Semi's government affairs committee, commented on the administration-proposed replacement to the current export administration act, which expired Sept. 30.

"There are current bills in both the House and Senate that have been developed over a period of time with inputs from Semi and other industrial associations, and both bills propose a new act that would be more explicit in how exports should be administered," Hansen said. "The administration's version, by comparison, is very broad and allows the administration to write export regulations any way it sees fit.

"The administration is working on a false assumption that equipment being 'diverted' to unfriendly countries comes largely from the U.S.," Hansen continued. "The reality is that less than 3% of all semiconductor manufacturing equipment produced in the free world, which is shipped to the Eastern bloc, is made in the U.S."

The House and Senate bills have met with the approval of Semi, as well as the Computer and Business Equipment Manufacturers Association, the American Electronics Association and the Scientific Apparatus Manufacturers Association. Hansen outlined the industry-supported legislation, which included:

- Elimination of certain individual license requirements within the block of countries belonging to the North Atlantic Treaty Organization, excluding Iceland, including Japan.
- Ensuring availability of bulk licenses, such as the distribution license, for exports to Western destinations.
- Establishment of a comprehensive operations license for the transfer of critical technology to Western destinations.

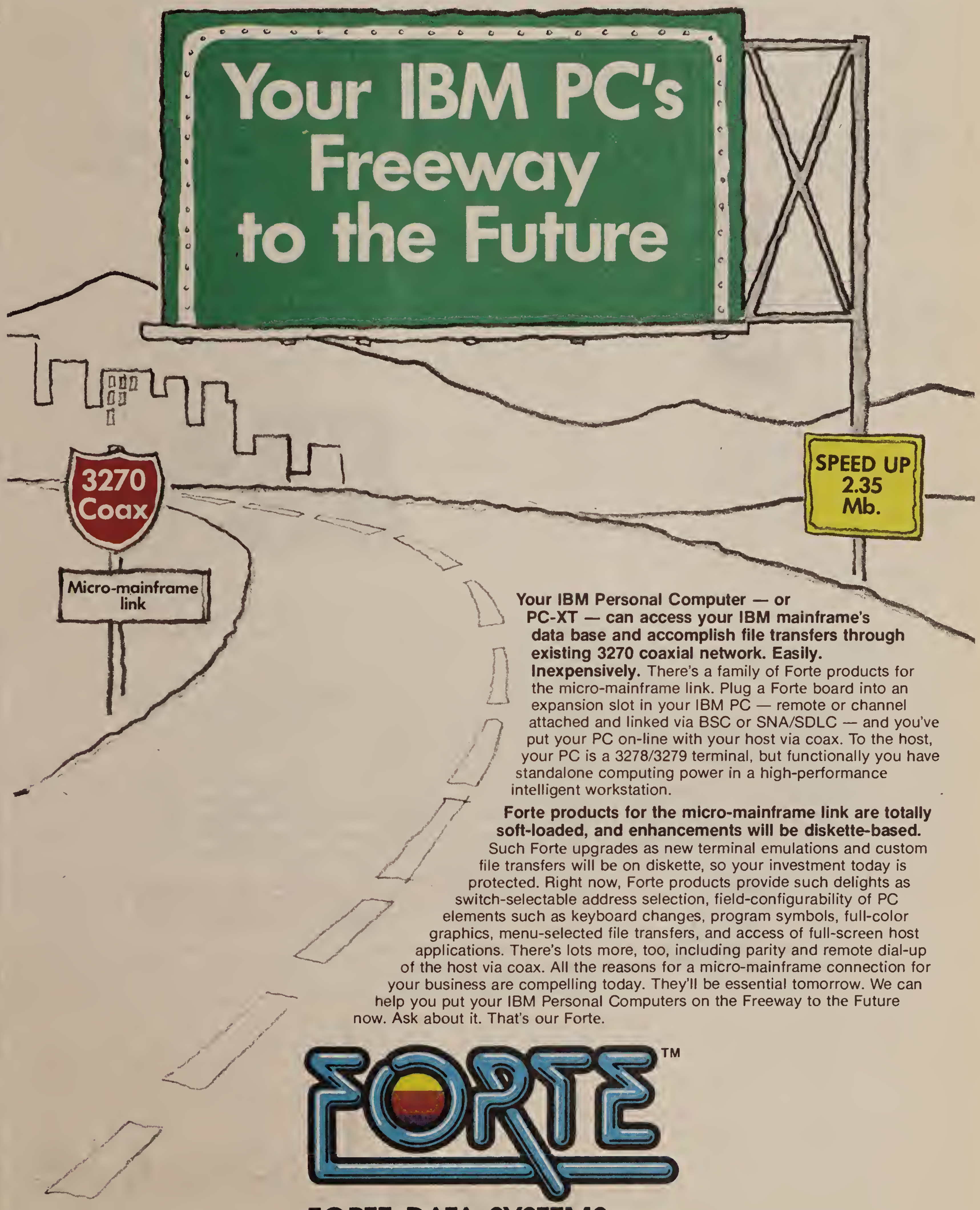
"Western overseas markets are indispensable to the growth of U.S. industry," Hansen said. "Any further steps to restrict U.S. sales to these markets in a pretense of restricting shipments to Eastern Europe could literally put many of our companies out of business."

U.S., Japan Pact Eliminates Tariffs on Semiconductors

WASHINGTON, D.C. — An agreement reportedly reached recently between the U.S. and Japan will eliminate tariffs on semiconductor imports in both countries beginning next spring.

A formal announcement is expected within weeks, as the Japanese must first seek clearance from their parliament. Legislation to cut the tariffs is also pending in the U.S. House.

The agreement is designed to stimulate trade between the two countries — the largest consumers of semiconductors in the world — and is considered a victory for the semiconductor industry here.



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Exec: What PCMs Need to Compete With IBM

By Robert Batt
CW West Coast Bureau

CW at IBM Futures

SAN FRANCISCO — Better technology, competitive prices and equal service and support facilities are essen tial for plug-compatible manufacturers (PCM) com peting with IBM.

This was the message delivered to data processing professionals and computer vendors at the IBM Futures Conference here recently by Robert O'Neill, director of corporate planning and business development at Amdahl Corp.

O'Neill told attendees at the conference that, for the most part, being equal to IBM is not good enough if PCMs are to succeed.

"The only way to be successful against IBM is to provide machines that offer significantly better performance than theirs at costs that at the very least are no worse than IBM's," he declared.

O'Neill, a former IBM researcher, said that with Big Blue's huge bulk buying ability, its costs per chip are inevitably lower. The only way to compete with IBM, according to O'Neill, is by having better technology and getting better performance per chip.

"It's going to be increasingly necessary to provide users with added value. Therefore a PCM vendor has to be as good as, if not better than, IBM's service and support systems.

"It's not enough on its own, but without it a manufacturer cannot stay in the game for long," O'Neill warned attendees at the IBM

(Continued on Page 93)

IBM to Gain Micro Share, Exec Says

(Continued from Page 89)

IBM and Apple Computer, Inc. becoming real money winners.

Big Blue, he asserted, will gain an additional 20% market share in 1983 compared with last year through the shipment of 600,000 Personal Computers and XT models. This compares with 190,000 Personal Computers shipped in 1982, the model's first shipment year.

In 1984, he continued, IBM will double its 1983 performance, excluding the expected introduction of the low-end Peanut computer.

While Apple will sell over 600,000 units of its Apple IIe this year, Wright said it will be the last personal computer product to have such a long life cycle (seven years).

The personal computer industry, he asserted, is undergoing a changing competitive environment, with product cycles getting shorter, vendor margins declining (now at around 17%, compared with 25% in 1980), less profitable distribution channels and increasing dealer requirements.

"To be a low-cost manufacturer and compete with IBM, you must add value to your material costs or be a better purchaser of components than IBM."

Wright said IBM's strategy for micros is to leave the pioneering to others, while developing technology in-house and purchasing from outside vendors. IBM will respond to competition only if it considers the incursion into the market serious.

Wright said that IBM plans to expand its personal computer marketing channels on a flexible but controlled basis.

By the end of the decade, Wright predicted, microcomputers will account for over 30% of data processing expenditures. To prepare for this, IBM will have an expansive low-end product line in place by 1985, including a low-cost personal computer, an upgraded Personal Computer, a home computer and terminals with local intelligence and peripherals for direct entry into data bases.

"IBM will have multiple products for each market segment. They will roll out their products and notch up a lot of winners," he claimed.

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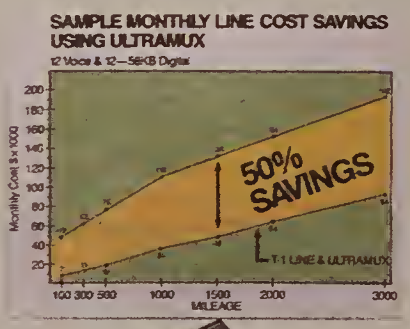

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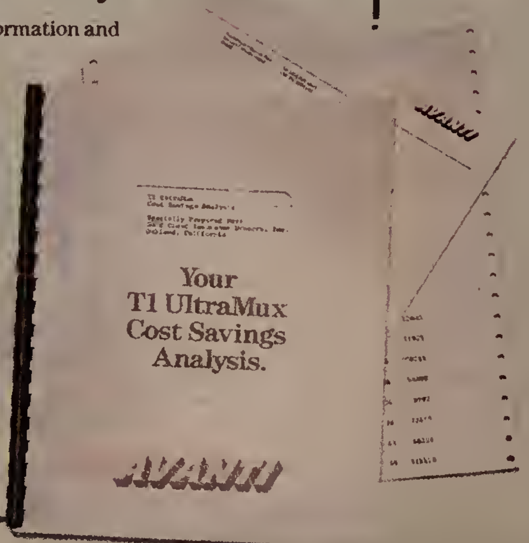

Industry Consultant Tells Attendees

Big Blue Seen Poised for Office of Future Assault

By Robert Batt
CW West Coast Bureau

SAN FRANCISCO — IBM is poised for a full-scale assault on the office of the future, overtaking AT&T in the process, according to an industry consultant.

John King, vice-president of the DMW Group, a consulting firm specializing in communications and data base technology, said IBM will emerge as a major player in all aspects of communications technology over the next 10 years.

Speaking at the recent IBM Futures Conference here, King said Big Blue's communications plan is to expand into new markets, take a leadership role where required, work with leading-edge companies such as Rolm Corp. and Satellite Business Systems and "cover all the bases," including office systems, local-area networks, private branch exchanges, network management and home computers.

'Architectural Upheaval'

"We are in the midst of an architectural upheaval in the world of information processing as communications technology becomes as important as computing, and by the end of this decade, IBM will be taking more money out of American business than the telephone companies," he asserted.

Claiming that AT&T's Western Electric is still in a "utility mode," King said users should not expect leadership products from AT&T.

"This does not mean that IBM will jump willy-nilly into things that are not related to what they are doing today. They are only slowly developing the gut feeling that moving information is as important as storing or processing it, and they are willing to follow the competition into new areas," he said.

IBM, King added, will initially concentrate its communications products on the business sector and evolve new products from its current installed base.

However, to grow in this new arena, he contended, IBM must recognize that its Systems Network Architecture (SNA) will not suffice.

CW at IBM Futures

While conceding that SNA is the dominant data communications network in the world today, with between 60,000 and 80,000 users, King said its major problem is that it was designed in an era when IBM thought all problems could be solved on mainframes.

"Implementations have become very cumbersome on SNA. Nevertheless, it has become too costly to abandon or rewrite [an estimated $30 billion of user code has been written to support SNA], and so it will be extended to include more applications, local-area networks and network management facilities," he said.

Turning to the low end, King asserted that the microprocessor-based desktop computer has changed the nature of computing and the requirements for communications.

"Mips [millions of instructions per second] are migrating straight to the desktop. By the end of 1984, more computing power will be on desktops than in computer rooms, and there is a growing need to make computing power conform to how people work," he said.

What is Needed To Compete With IBM: Exec

(Continued from Page 92)

conference.

This will not be easy, according to O'Neill, because of increasingly unfavorable cost ratios in the area of service and support. Labor costs are going up, he explained, at the same time that hardware costs are decreasing.

This means that as more devices are integrated into the hardware — a job for skilled DPers — units that need to be replaced become more expensive.

Squeezing Mini Sector

In line with other speakers at the IBM conference, O'Neill asserted that the rise of the microcomputer and the sustaining influence of mainframes are resulting in the squeezing of the minicomputer sector.

"The mainframe is the engine for certain types of processing, for example, the creation of centrally controlled large files, which micros or distributed processing will never be able to take over.

"At the same time," he continued, "the growth of micros is supplying work for mainframes and therefore aiding their growth. Mainframes would be growing by 10% to 15% less than they currently are if it were not for micros."

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Forecasts & Findings

BOCs to Reap Windfall

The deregulated Bell operating companies will experience a $5 billion regulatory windfall over the next decade from the implementation of cellular-radio telephone service, according to "Cellular Mobile Radio," a report from International Resource Development, Inc. (IRD).

With telephone companies granted rights to one of two cellular systems for each city authorized by the Federal Communications Commission, and competition for the other rights likely to result in delays for nontelephone company bidders, the former operating companies should build up a lead of 700,000 users of the services, according to IRD.

The report is priced at $1,850 and is available from IRD, 30 High St., Norwalk, Conn. 06851.

Software Houses Tested

Systems software for microcomputers will need to become more powerful and easier to use to satisfy greater demands and will play a major determining role in spectacular marketing successes and failures over the next few years, according to a report by Creative Strategies International, Inc. (CSI).

Software houses will face a challenge to their market holds as increased memory capacities and lower transportability barriers between systems take hold, CSI said. Companies will have to be well positioned in all areas of microcomputer strategy to remain viable, according to the report, which examines the structure of the industry.

"Microcomputer Operating Systems" is available for $1,450 from CSI, Suite 275, 4340 Stevens Creek Blvd., San Jose, Calif. 95129.

On-Line Banking Booming

On-line branch equipment for banking systems will create a $4.8 billion market over the next five years, with automated teller machines (ATM) and cash dispensers comprising 51% of the market and teller terminals another 41%, according to a report from Frost & Sullivan, Inc.

While banks and thrift institutions will continue to consolidate, the number and size of bank branches will grow, and the growth will require on-line equipment to ease management of the larger networks, the report said. Commercial banks will place 68.2% of the orders, with savings and loans acquiring 22.4%, according to the study.

Priced at $1,275, "On-Line Branch Banking Forecast: 1983-87" is available from Frost & Sullivan, 106 Fulton St., New York, N.Y. 10038.

AT&T Seen Losing Share

AT&T is likely to continue to lose market share in the $800 million modem industry in the U.S. as deregulation offers more opportunities than problems to independent vendors, according to a report by Venture Development Corp. (VDC).

Although AT&T originally set the standards for modems, independents have selected market niches and have innovated technologically, while AT&T has failed to respond quickly to opportunities presented by changes in technology and the competitive environment, according to "The Market For Voice Grade Modem Equipment."

Priced at $2,790, the report is available from VDC, 1 Washington St., Wellesley, Mass. 02181.

Mag Media Mart to Grow

The computer magnetic media industry will grow at a 30.9% annual rate over the next five years, with flexible diskettes experiencing a market-share growth from 33% in 1982 to 56.5% in 1987, according to "The Computer Magnetic Media Industry: A Strategic Analysis 1982-1987," a 250-page study by Venture Development Corp. (VDC).

In 1982, media shipments totalled $1.3 billion and should grow to $5.2 billion in 1987, according to the report. The flexible-diskette industry will grow at an annual compound rate of 45.8% over the five-year period, increasing sales from $445.1 million to $2.9 billion.

The study is available for $3,290 from VDC, 1 Washington St., Wellesley, Mass. 02181.

Outside Maintenance OK

Computer users have a much higher opinion of independent computer maintenance firms than most computer and terminal manufacturers believe, according to a recent study by Frost & Sullivan, Inc.

The study, "Third-Party Maintenance of Computers and Data Terminals in the U.S.," states that "the use of third-party maintenance may have a significant place in your business." The study showed that most computer and data terminal users think third-party maintenance companies are as good or better at maintenance than the computer maker, often more responsive and nearly always lower in price.

Independents now account for about 10% of the total computer and terminal maintenance market, the study reported.

The study is available for $1,350 from Frost & Sullivan, which is located at 106 Fulton St., New York, N.Y. 10038.

Competition, Pricing Wars Seen in Portables Market

NORWALK, Conn. — Bitter competition and pricing wars are forecast in the portable and transportable computer market, according to a recent report from International Resource Development, Inc.

The 215-page report predicted that "at least half of the current manufacturers of portables will be acquired, out of business or in niche markets within the next three years."

The report also estimated that by 1987 approximately one-quarter of all personal business computers and office workstations will be portable, amounting to more than a million units.

The report advised manufacturers to seek out small, specialty, industry-specific markets to escape the bruising competition in the general "white-collar productivity tools" market area.

Successful manufacturers in the portable computer market of the mid-'80s will likely be those who have achieved good distribution and lowered manufacturing costs, according to the report.

Entitled "Portable Computers," the report (568) is available for $1,650 from International Resource Development at 30 High St., Norwalk, Conn. 06851.

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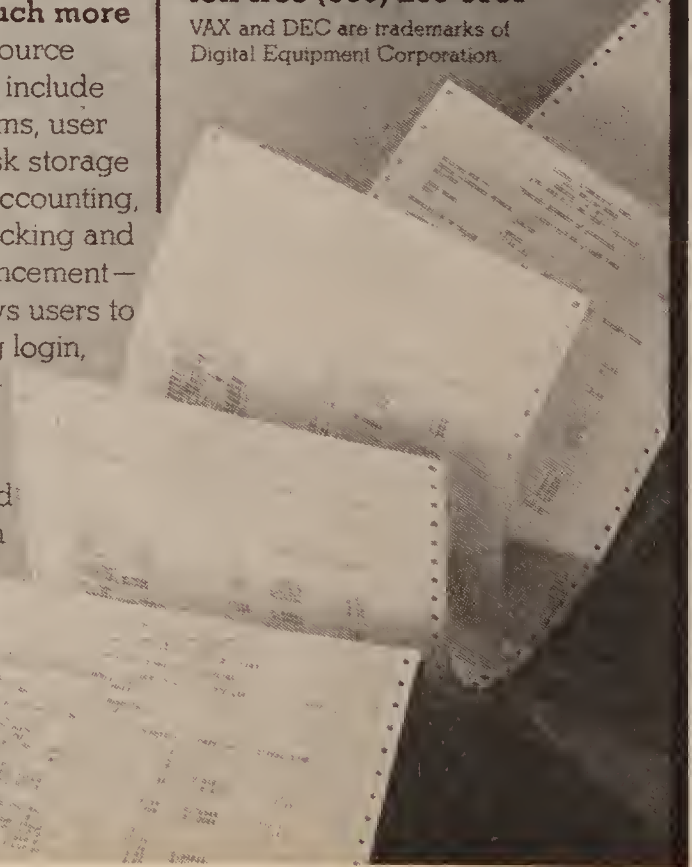

CDC to Expand Business Advisors Subsidiary

MINNEAPOLIS — Control Data Corp. has announced plans to market the expertise of company specialists in human resource development and strategic planning through the expansion and reorganization of Control Data Business Advisors.

One hundred and fifty corporate staff employees have been transferred to Business Advisors, a wholly owned subsidiary of CDC, where they will be included in the work force of three new Business Advisors organizations that will market their skills nationally while still providing them to the parent company.

According to a company spokesman, the reorganization of Business Advisors is an example of Control Data's strategy of using existing staff resources to establish additional businesses or profit centers that sell services to the parent company and the external market.

By marketing the staff functions, the company expects to reduce overhead expenses while increasing Business Advisors' product offerings and revenues.

Under the expansion and reorganization plan, Business Advisors' President George F. Troy will oversee three operating companies: the Human Resources Services Co., to be headed by President Roger G. Wheeler; the Marketing and Planning Services Co., with President James R. Morris; and the Small Business Services Co., which will be under the direction of President Gail E. Bergsven.

GSS Developing Drivers for Manufacturers

WILSONVILLE, Ore. — Graphic Software Systems, Inc. (GSS) has begun a program to distribute software device drivers to graphics peripheral equipment manufacturers.

Through the Peripheral Vendor Distribution Program, manufacturers can obtain standard device drivers for MS-DOS as well as Vision for the personal computer. Drivers for Unix will be available soon, GSS said.

To participate in the program, the manufacturer supplies GSS with a prototype or production version of the peripheral. GSS will then develop, debug and test the device driver with a number of different personal and small business computers. After the manufacturer approves the driver, it is placed in GSS-Drivers, a library of drivers for distribution to microcomputer OEMs and independent software vendors. The peripheral manufacturer receives the device driver, rights to royalty-free distribution and appropriate documentation.

Cost of the device drivers ranges from $10,000 to $25,000 from GSS through P.O. Box 673, 25117 S.W. Parkway, Wilsonville, Ore. 97070.

New Division To Concentrate On Office Mart

ROCHESTER, N.Y. — Computer Consoles, Inc. has established its Office Systems Group to develop integrated hardware and software products for the office market.

The division, based in Reston, Va., will develop systems building on the company's telephone technology and incorporating word and data processing, file management, electronic mail and administrative and decision support functions. New products emanating from the group will feature integrated software, the Unix operating system and several fault-tolerant capabilities, the company said.

John McNulty, vice-president and general manager, will head the new group. The division's initial product offering is Officepower, a Unix-based system incorporating several office automation features.

Disk Cartridge Key to Iomega, Verbatim Pact

SUNNYVALE, Calif. — Verbatim Corp. and Ogden, Utah-based Iomega Corp. have entered into a joint licensing agreement to produce a flexible disk cartridge.

Under the terms of the agreement, Verbatim will supply Iomega with the media for the disk cartridge, which will incorporate Bernoulli technology.

Commenting on the agreement, Gabriel Fusco, president and chief executive officer of Iomega, said, "Flexible disk cartridge technology will bring into one product the removability and low cost of flexible disks with the superior storage capabilities and random-access time of rigid, giving end users another alternative in magnetic media storage.".

Iomega manufactures and markets the Alpha 10, an 8-in. flexible disk cartridge, and the Beta 5, its 5¼-in. version.

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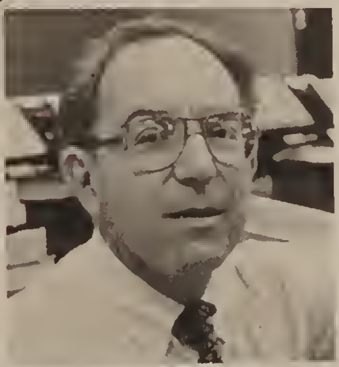

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Executive Corner

- **Gerald A. Poch** has been named president and chief operating officer of Technicom International, Inc.

- **Martin F. Ryan** has been appointed president of Pro Computing.

- **Richard A. Gutermuth** has been appointed president and chief executive officer, and **Cecil Morehouse Jr.** has been named vice-president of finance at Computer System Dynamics.

- **Shozo Yokogawa**, president and chief executive officer of Yokogawa-Hokushin Electric Corp., has been elected to Hewlett-Packard Co.'s board of directors.

- **Edward F. Thompson** has been named vice-president, chief financial officer and secretary of Amdahl Corp.

- **George F. Brecht Jr.** has been named vice-president of administration at Digital Systems Corp.

- **Terry Schmidt** has been promoted to vice-president and general manager of Carterfone Communications Corp.'s Information Systems Division.

- **James C. Cogan** has been appointed vice-president of operations at Wicat Systems, Inc.

- **Gerald F. Atterbury** has been appointed vice-president of engineering at Data Electronics, Inc.

- **John DiGregorio** has been elected vice-president, sales, at Starnet Corp.

- **John R. Cook** has been named vice-president, corporate development, at Wyly Corp.

- **Klein S. Gilhousen** has been promoted to vice-president, advanced technology, at M/A-COM Linkabit, Inc.

- **Robert J. Bodnar** has joined North Star Computers, Inc. as vice-president, U.S. sales.

- **Howard M. Drourr** has been promoted to senior division vice-president of Anacomp, Inc.'s Data Systems and Services Group.

- **George W. MacIntyre** has been named vice-president, marketing, for Lantech Systems, Inc.

- **Jonathan D. Rick** has been appointed vice-president and general manager of Northern Telecom, Inc.'s Northeast Electronics Division.

- Data General Corp. has named **George D. McClelland** vice-president and treasurer; **Donald L. McDougall**, vice-president and general manager of the Technical Products Division; and **J. Thomas West**, vice-president, Systems Development Division.

- **Rodger M. Sanders** has been appointed director, operating arrangements, at RCA Global Communications, Inc.

AT&T Branch, Firm Announce Lease Program

PARSIPPANY, N.J. — Anticipating the future growth potential of videotex and teletext services, AT&T Consumer Products and the Machine Tool Finance Corp. of Bridgewater, N.J., recently announced a new lease/purchase program for AT&T's Frame Creation System.

The program for the system, which allows users to create, edit and format graphics and textual information for videotex and teletext applications, will be available through Information Systems.

According to Clarence Selin, director of Consumer Information Products for AT&T Consumer Products, the company expects interactive services will continue to increase in popularity. He said the company intends to support that growth, which will make two-way information services available to millions of households by 1990.

The Information Systems leasing subsidiary was established solely to accommodate the leasing of videotex, teletext and other information systems equipment.

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IBM's French Factory Customizes Latest Chips

By Paul Gillin
CW Staff

CORBEIL-ESSONNES, France — In the eerie yellow light of an environment that more closely resembles a laboratory than a factory, IBM here is producing integrated circuits for its full line of large computers — including the new 4361 and 4381 — using equipment and procedures the company says are the most advanced in the world.

The methods are a step up from the "liquid" technology of chip production that has dominated that field since integrated circuits were first introduced in the early 1960s. For the first time they allow chips to be customized without requiring engineering changes or retooling, a spokesman said.

Discarding traditional photolithography methods, which are too unreliable for high-density production, the procedure allows chips to be generated directly from magnetic tapes prepared by computer-assisted design (CAD). The new techniques further allow a variety of integrated circuit types to be etched on the same silicon wafer, a capability that was also not previously available.

Corbeil-Essonnes is the largest integrated circuit plant in Europe and maintains the world's largest catalog of parts, with over 16,000 different numbers, IBM said. It produces integrated circuits for all IBM large computers distributed outside the U.S.

'Clean' Environment

Production takes place in a "clean" environment in which air purification equipment occupies nearly as much space as manufacturing equipment. Air is purified to the point of less than 100 particles per cubic foot compared to tens of thousands in the fresh air of the surrounding French countryside. Workers, clad from head to foot in sterile white lab gear, tread in antistatic shoes on floors that are scrubbed three times every five days. In all, the degree of cleanliness is "1,000 times better than in surgery," according to IBM spokesman Raymond Duranton. Still, dust is the primary enemy of integrated circuits, more than 54% of which are discarded as unusable after the six-month manufacturing process is complete.

Two new processes, however, have recently improved both the reliability and flexibility of chip production, Duranton said. Electron-beam etching uses a high-intensity shaft of energy to carve channels in the silicon wafers. The etches are then filled with boron — conducting material that is injected into the paths.

The process of preparing the silicon wafer has not changed much in recent years. Cylinders of pure silicon from Germany are cut using diamond-tooth saws into slices measuring 0.4 mm across. The wafers are then polished to a mirror finish and coated with photosensitive resin.

However, etching and "doping," which is the process of injecting the boron into the chips, have been improved with the new technology. Whereas etching was previously done by exposing the wafers to light through a photo mask and washing away the substrate with acid, the electron-beam technology produces a cleaner and sharper etch, Duranton said.

Driven by two IBM 3033 mainframes and multiple slave minicomputers, the electron scanner directs deflected beams onto the integrated circuit. The design is driven by a CAD program written on magnetic tape. The computer-intensive application makes Corbeil-Essonnes, "the largest IBM customer in Europe," he said.

Doping was previously done at high temperatures with gas diffusion in a process that required precise temperature control for long periods of time. The new process uses particle acceleration and ion implantation to direct a nearly pure shaft of particles into the etches. The beam is so pure that an injection of 1,020 atoms per square centimeter can be controlled to a purity of 100 atoms per square centimeter, Duranton said.

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CDC, NCR Division to Open CAD Services Center

SANTA CLARA, Calif. — Control Data Corp. and NCR Corp.'s Microelectronics Division have jointly announced the opening of an electronic computer-aided design (CAD) services center.

Through the venture, the vendors will offer a combination of consulting, training and computing resources designed to assist integrated circuit manufacturers and systems houses in applying state-of-the-art CAD techniques, from the initial design concept to the production stage.

Located here, the center will be managed by CDC's Information Systems Design unit and has specially designed and equipped work areas for customer use, including engineering workstations hooked into CDC's Cybernet data services network.

NCR will provide its Semicustom Design System, an integrated set of tools for design capture, logic simulation, performance analysis and ac/dc test generation. The computer-simulated circuit description will be transmitted via Cybernet services to NCR. Device fabrication will take place at NCR's Fort Collins, Colo., microelectronics facility.

AT&T Announces Officers Of Info Systems Division

MORRISTOWN, N.J. — AT&T has announced the top officers of its Information Systems Division, which will provide installation, maintenance and sales services for the comany's business customers in 1984.

Bruce G. Schwartz has been named division president, effective Jan. 1, and William G. Ebben was appointed executive vice-president, responsible for national services operations.

Additionally named as officers were: John Berndt, Eldon Hanes and Peter Milano, all vice-presidents reporting to Schwartz; and regional vice-presidents Paul Caswell, Northeast; Tom Cross, Mid-Atlantic; Bob Haley, Southeast; Ken McLarty, Great Lakes; Dan Wiedemeier, Western; and Bob Clark, Pacific, all reporting to Ebben.

The new division will comprise 60,000 field services and sales employees, who will be transferred from the Bell operating companies when the court-ordered divestiture is initiated.

AT&T said that the employees will be doing for the new division what they are presently doing for the Bell operating companies, namely leasing, selling, installing and maintaining the company's line of communications equipment.

Compucorp Plans To Acquire Litton's Monroe

SANTA MONICA, Calif. — Compucorp, Inc. recently announced the signing of a letter of intent to purchase the operating assets and business of the Monroe Division of Litton Business Systems, a subsidiary of Litton Industries, Inc.

According to Compucorp President Elmer R. Easton, the addition of Monroe's resources would give Compucorp one of the largest distribution capabilities of office automation and related products in the U.S. The company said the combined sales of Compucorp and Monroe are currently $200 million a year.

Monroe, which has assets of approximately $100 million, will be owned 80% by Compucorp and 20% by Litton, with the intent of eventual 100% ownership by Compucorp. The transaction, which is expected to close by year end, is subject to approval by the board of directors and shareholders of Compucorp and the board of directors of Litton.

Monroe markets a line of calculator, computer, copier and accounting machine products. Compucorp manufactures and markets a line of office automation products and systems ranging from stand-alone word processors to multistation local-area networks.

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The *Computerworld Buyer's Guide to Software* is the third in our series of market-specific directories to computer-related vendors, products and services. It will offer detailed, all-inclusive listings and up-to-date information on software packages and the companies that sell them. Listings are divided into two sections: complete product listings and vendor profiles. Product listings include application software, DBMS, utility software, decision support systems, systems software, microcomputer software and more. Vendor profiles include company name, address, contact information, primary markets served and more. Tab dividers separating each category and cross references will further add to ease-of-use. In addition, there will be articles on topics such as new thinking in DBMS, software distribution, micro-to-mainframe links and artificial intelligence.

There are an estimated 6,000 vendors in the software market. The *Computerworld Buyer's Guide to Software* will provide buyers with much needed help in sorting through the diverse packaged software offerings. And, it will offer advertisers a powerful vehicle for telling their story to *Computerworld* subscribers at that crucial moment when they are actively seeking software and vendors.

The issue date for the *Computerworld Buyer's Guide to Software* is November 23. Watch for our other *Computerworld Buyer's Guides* in 1984.

The *Computerworld Buyer's Guides* are sent exclusively to the more than 114,000 *Computerworld* subscribers in the U.S. One more good reason to subscribe to *Computerworld.*

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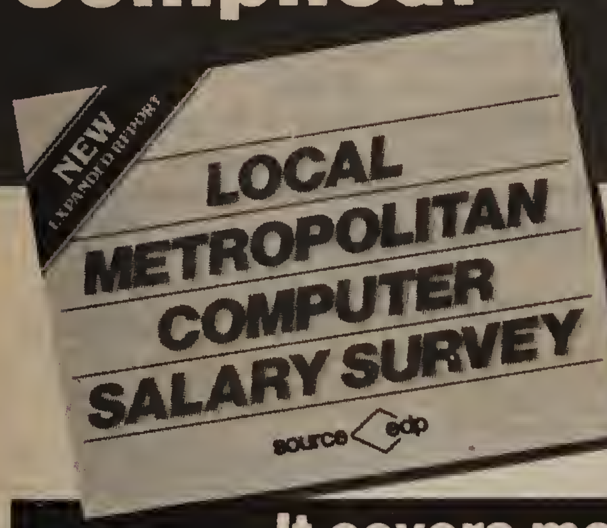

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You will assist with design review, design coordination and product planning. Other responsibilities include current/future product research and consulting to the Marketing Department.

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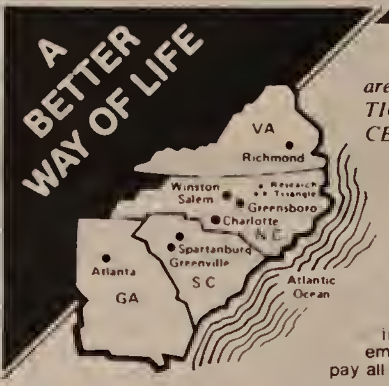

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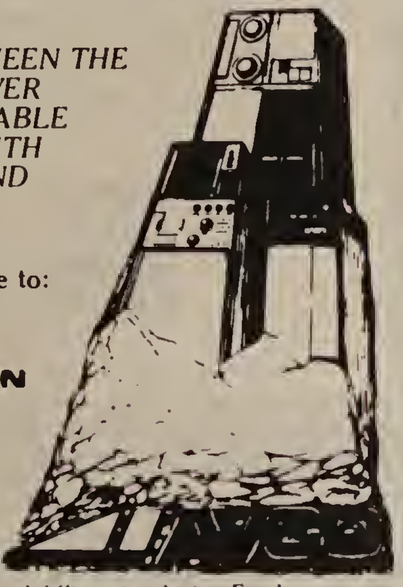

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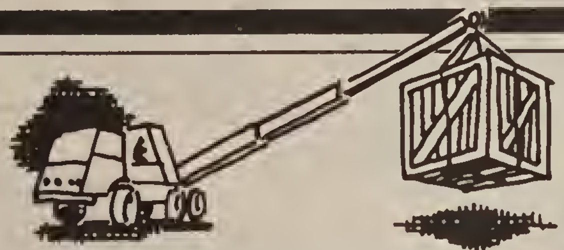

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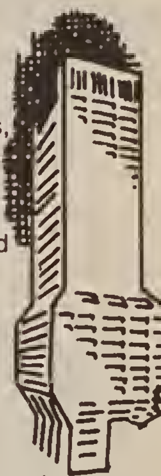

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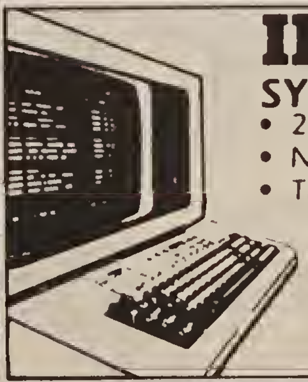

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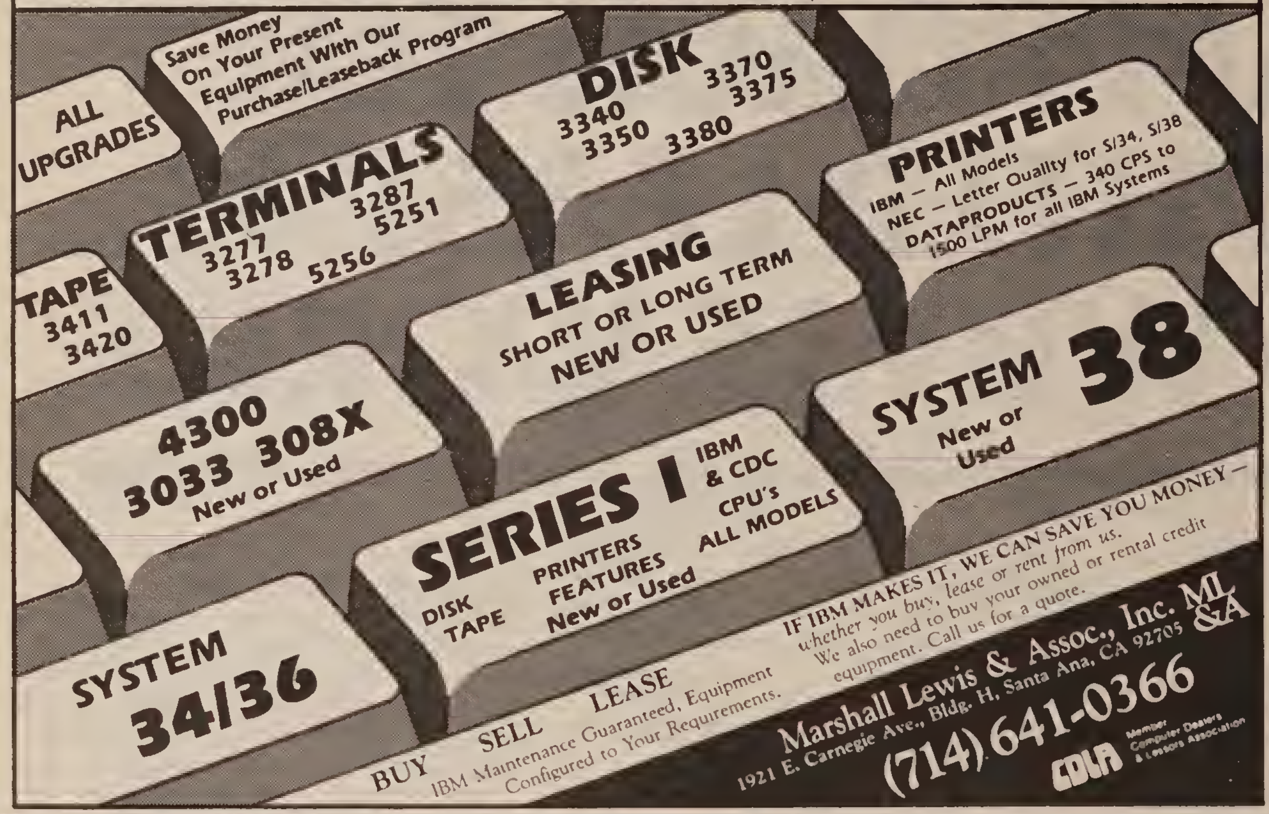
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Ads may be mailed in, cleanly typewritten, with a letter stating the size desired and the issue in which it is to be run. Our team of adtakers will take ads that require no artwork or borders over the phone. We also provide telecopier service.

Any borders, logos, or artwork should be sent in with your ad and must be dark and clear enough to be reproduced.

Computerworld comes out every Monday and our deadline for receiving ads is 10 days (or six working days) prior to the issue date desired.

First time advertisers must send payment along with their first ad.

Our mailing address is:

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Box 880
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WANG #	DEC #	CDC #	ERST-CDC PRICE
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2265 V-1	RMO 3	9762	8,500
2265 V-2 (6565)	RMO 5	9766	12,900

Prices include installation. 90-day full maintenance (Also available after 90 days). stand, cables, terminator. (Controllers additional.)

BAND PRINTERS

WANG #	DEC #	Data Products #	ERST-DP PRICE
2273-1 (300 LPM)	LP 11-A, B	B-300	$ 5,675
2273-2 (600 LPM)	LP 11-EA, EB	B-600	7,475

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WANG #	DEC #	ERST #		PRICE
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2265V-2 (6565)	RMO 5	490-4574	Disk Pack	642 ea.
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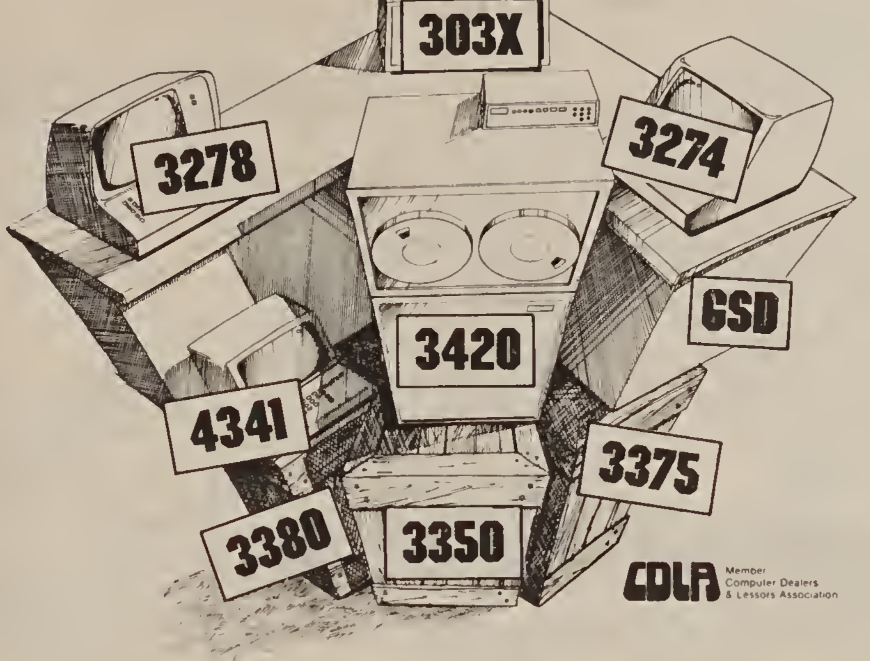

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Detroit	(313) 995-8717
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Los Angeles	(213) 670-7994
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Ad closing is every Friday,
6 working days prior to issue date.

Rates: Open rate is $112.70 per column inch. Columns are 2" wide. Minimum ad size is 2 column inches (1 column wide by 2 inches deep), and costs $225.40 per insertion. Additional space is available in half-inch increments. Some sample sizes and costs are shown.

1 col x 4"	$450.80
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2 cols x 8"	$1803.20

Discounts are available when you run more than 35 column inches of advertising in a year anywhere in Computerworld. Box Numbers are available, $15.00 per insertion.

To reserve space for your ad, or if you'd like more information on Classified advertising in COMPUTERWORLD, call our office nearest you.

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New York - (201) 967-1350
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San Francisco - (415) 421-7330
Los Angeles - (714) 556-6480
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William J. Mills,
Manager Classified Advertising

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THE NEWSWEEKLY FOR THE COMPUTER COMMUNITY
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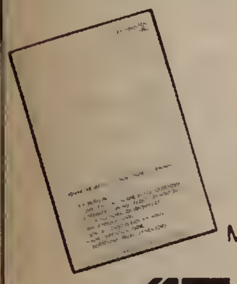

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DZ11-E (new)	$3,595	RUA80-AA (new)	Call
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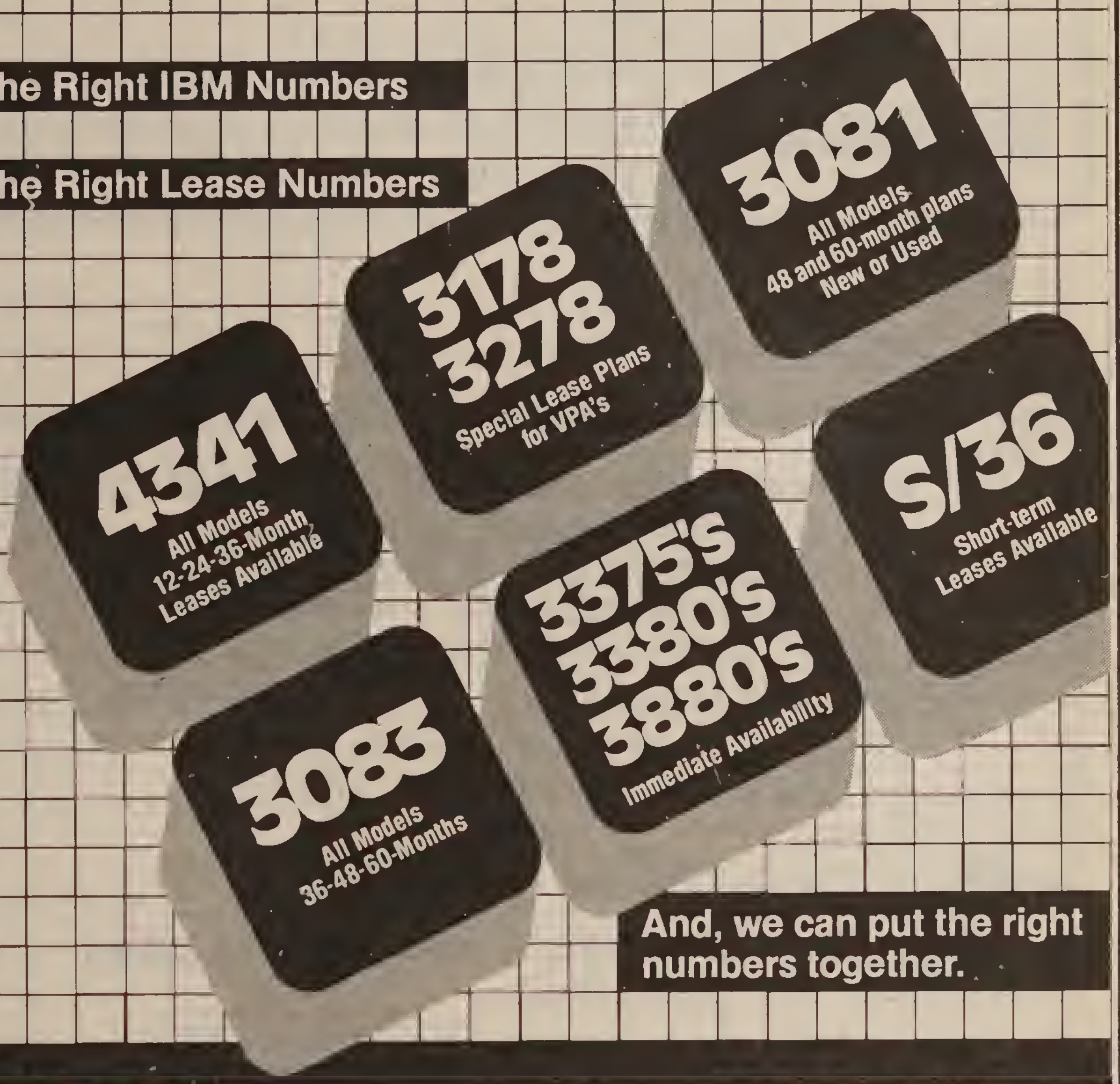

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BIDS & PROPOSALS

NOTICE OF REQUEST FOR PROPOSALS

The General Manager of the Utah Transit Authority requests the submission of proposals in five copies to Darrell Swenson, Grants Administrator, Utah Transit Authority, 3600 South 700 West, P.O. Box 31810, Salt Lake City, Utah 84131, any time prior to the hour of 2:00 p.m. on Monday, October 24, 1983 for furnishing a computer-based software inventory system to Utah Transit Authority.

This project is being financed in part with Federal funds. The contract to be let, therefore, is subject to the terms of a financial assistance contract between the Utah Transit Authority and the U.S. Department of Transportation.

The proposals will be received and recorded at the office of the Grants Administrator of the Utah Transit Authority, 3600 South 700 West, P.O. Box 31810, Salt Lake City, Utah 84131 at 2:00 p.m. on Monday, October 24, 1983. The Authority reserves the right to waive any irregularities and informalities or to reject any or all proposals submitted to and accepted by the Authority. The Authority further reserves the right to select the proposal in order to negotiate a contract and to make a contract award in the best interest of the Authority.

The contractor will be required to comply with all applicable and equal employment opportunity laws and regulations. The Utah Transit Authority in accordance with Title VI of the Civil Rights Act of 1964, as amended, and 49 CFR Part 23 issued pursuant to the Act will afford Disadvantaged Business Enterprises (DBE's) and Women Business Enterprises (WBE's) full opportunity to respond and will not discriminate against any interested firm or person on the basis of race, color, sex, age or national origin in the review of qualifications or contract award. Qualified firms will be required to address the utilization of DBE's and WBE's in the text of their proposals.

Proposal forms and specifications will be furnished upon request.

Any name appearing on the Comptroller General's List of Ineligible Contractors for Federally Financed and Assisted Construction, Materials or Equipment Contracts is not an eligible bidder.

John C. Pingree
General Manager
Utah Transit Authority

NOTICE

Solicitation of Consultant Services For Operation of Control Center Integrated Motorist Information System N.Y. State Department of Transportation

The New York State Department of Transportation is soliciting consultant services to operate a computer-assisted freeway and arterial street traffic management control center at its Region 10 office in Hauppauge, New York. The operators at the control center will oversee traffic operations on 128 miles of highways in the northwestern quadrant of Long Island.

Any firm wishing consideration and further information must submit a letter of interest together with Federal Standard Form 254 to Mr. Joseph Contegni, IMIS Project Director, New York State Department of Transportation, State Office Building, Veterans Memorial Highway, Hauppauge, New York 11788, no later than Thursday, November 10, 1983.

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The **Omaha Public Power District** invites proposals for an interactive computer software package to perform electical distribution planning and analysis and to install this software on either the District's IBM 4341 mainframe or on a minicomputer supplied by the vendor. Interested vendors capable of providing such a package may obtain copies of the specifications by contacting:

E. Morrissette, Manager-Contracts
Omaha Public Power District
1623 Harney Street
Omaha, NE 68102
Tel. (402) 536-4680

Requests will be received until 4:30 pm October 7, 1983.

CLASSIFIED ADVERTISING ORDER FORM

Computerworld's Classifieds work.

Issue Date: Ad closing is every Friday, 10 days prior to issue date.

Sections: Please be sure to specify the section you want: Time and Services, Software for Sale, Position Announcements and Buy/Sell/Swap. (Available upon request: Software Wanted, Turnkey Systems and Real Estate.)

Copy: We'll typeset your ad at no extra charge. Please attach CLEAN typewritten copy. Figure about 25 words to a column inch, not including headlines.

Cost: Our rates are $112.70 per column inch. (A column is 2" wide.) Minimum size is two column inches (2" wide by 2" deep) and costs $225.40 per insertion. Extra space is available in half-inch increments and costs $56.35. Box numbers are $15.00 extra.

Billing: If you're a first-time advertiser, (or if you have not established an account with us.) WE MUST HAVE YOUR PAYMENT IN ADVANCE.

Ad size desired:

________ columns wide by ________ inches deep.

Issue Date(s): ________________________

Section: ________________________

Signature: ________________________

Name: ________________________

Company: ________________________

Title: ________________________

Address: ________________________

Telephone: ________________________

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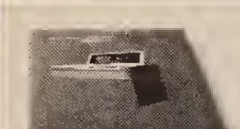

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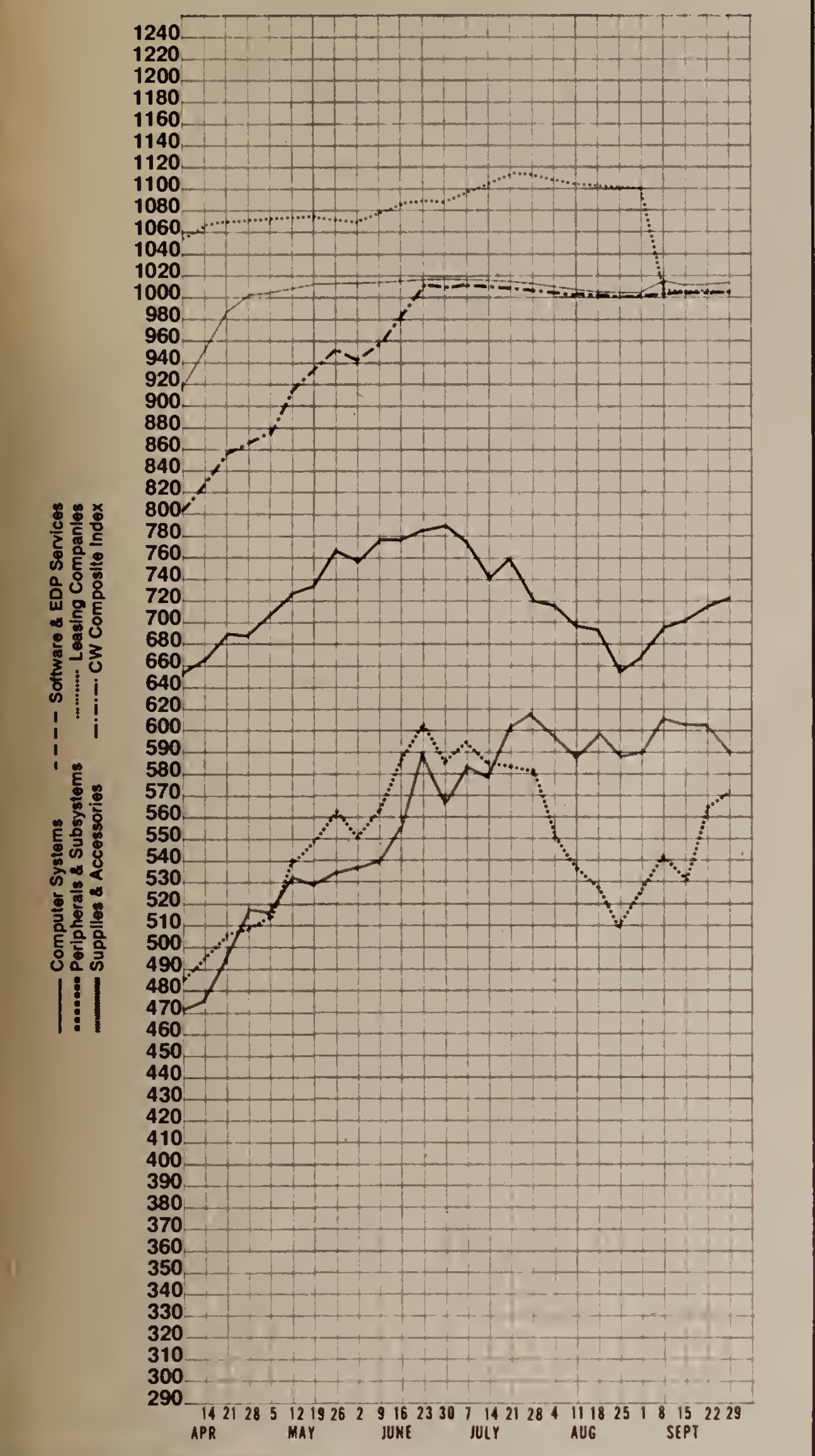

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Computerworld Stock Trading Summary

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CLOSING PRICES WEDNESDAY, SEPTEMBER 28, 1983

COMPUTER SYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE SEP 28 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	ALPHA MICROSYSTEMS	12- 24	16 1/4	+ 1/4	+1.5
O	ALTOS COMPUTER SYST	9- 28	9 1/2	-1 3/4	-15.5
A	AMOAHL CORP	9- 30	19 3/4	+ 7/8	+4.6
O	APPLE COMPUTER INC	23- 63	22 7/8	-8 5/8	-27.3
N	AT&T	60- 70	65 3/8	-2 1/8	-3.1
N	BURROUGHS CORP	28- 58	54 1/8	- 7/8	-1.5
O	COMPUTER AUTOMATION	7- 17	7 3/8	-3 7/8	-34.4
A	COMPUTER CONSOLES	8- 26	19 5/8	-1	-4.8
N	CONTROL DATA CORP	21- 62	51	0	0.0
D	CONVERGENT TECHNOL	22- 41	24 7/8	- 1/2	-1.9
N	CRAY RESEARCH INC	20- 52	44 5/8	- 1/4	-0.5
N	DATA GENERAL CDRP	20- 82	80	+5 5/8	+7.5
N	DATAPOINT CORP	11- 36	25 5/8	+ 1/4	+0.9
N	OIGITAL EOUIPMENT	62-132	106	- 1/4	-0.2
A	EECD INC	6- 16	14 5/8	- 5/8	-4.0
N	ELECTRONIC ASSOC.	5- 15	12 3/4	- 1/2	-3.7
N	FLOATING POINT SYST	16- 44	35 1/8	+1 1/8	+3.3
N	FDXBDRO	22- 47	34 7/8	+1 1/8	+3.3
O	GENERAL AUTOMATION	3- 16	11 1/4	- 3/4	-6.2
N	GDULD INC	31- 44	32 1/8	-1 7/8	-5.5
N	HARRIS CORP	20- 51	38 3/4	+1 1/2	+4.0
N	HEWLETT-PACKARD CO	22- 48	43 1/4	-2	-4.4
N	HONEYWELL INC	60-125	124	+1 7/8	+1.5
N	IBM	57-129	128 3/4	+5 3/4	+4.6
D	IPL SYSTEMS INC	5- 14	8 1/2	- 1/4	-2.8
N	LANIER BUSINESS PROO	12- 21	19 3/4	+ 5/8	+3.2
N	M/A-COM INC	22- 35	27	-1 1/4	-4.4
O	MAGNUSON COMP SYSTS	2- 5	7/8	0	0.0
N	MANAGEMENT ASSIST	7- 18	10 1/2	- 3/8	-3.4
N	MATSUSHITA ELEC(ADR)	47- 75	74 3/4	+6 1/4	+9.1
N	MODULAR COMPUTER SYS	6- 16	12 3/4	-1 1/2	-10.5
N	MOHAWK DATA SCI	10- 19	14 1/8	+ 3/4	+5.6
N	MOTOROLA INC	82-140	146	+7 1/2	+5.4
N	NAT'L SEMICDNDUCTOR	22- 80	57	+2 1/8	+3.8
N	NCR	39-130	128 1/4	+4 3/8	+3.5
N	PERKIN-ELMER	17- 37	35 1/8	- 7/8	-2.4
N	PRIME COMPUTER INC	11- 30	17 1/2	+1	+6.0
N	SPERRY CORP	21- 46	46	+ 3/8	+0.8
O	TANDEM COMPUTERS INC	14- 36	35 3/8	- 1/2	-1.3
N	TANDY CORP	37- 65	38 1/2	-5 1/8	-11.7
D	TELEVIDEO SYSTEMS	16- 41	16 7/8	-1 5/8	-8.7
N	TEXAS INSTRUMENTS	71-176	116 3/8	- 3/8	-0.3
O	VECTOR GRAPHICS INC	4- 14	3 5/8	- 5/8	-14.7
A	WANG LABS "B	13- 42	34	- 1/2	-1.4
A	WANG LABS "C"	11- 42	34 1/4	+ 1/8	+0.3
N	XEROX CORP	35- 50	43	-1	-2.2

LEASING COMPANIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE SEP 28 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	BOOTHE FINANCIAL CP	11- 30	29 3/4	+1 3/4	+6.2
N	COMOISCO INC	7- 42	38 1/2	-1 3/8	-3.4
O	CONTINENTAL INFO SYS	3- 16	13 3/4	+ 1/2	+3.7
N	OPF INC	5- 14	14 3/8	+1 3/8	+10.5
N	U.S. LEASING	18- 47	40 7/8	- 5/8	-1.5

EXCH: N=NEW YDRK; A=AMERICAN; P=PACIFIC; B=BOSTDN;
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SDFTWARE & EDP SERVICES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE SEP 28 1983	WEEK NET CHNGE	WEEK PCT CHNGE
O	AOVANCEO COMP TECH	1- 8	4 1/2	- 1/4	-5.2
O	ADVANCEO SYSTEMS INC	6- 22	17 3/4	0	0.0
D	AGS COMPUTERS INC	7- 32	25 1/2	-2	-7.2
D	AMERICAN SOFTWARE	21- 31	27 3/4	- 1/4	-0.8
N	ANACOMP INC	9- 23	9 7/8	+ 5/8	+6.7
O	ANALYSTS INTL CDRP	5- 20	13	+1	+8.3
A	APPLIED DATA RES.	8- 37	29 1/4	- 3/4	-2.5
D	ASK COMPUTER SYSTEMS	6- 21	20 3/4	+ 1/2	+2.4
B	ASTRADYNE COMP INO	1- 7	4 3/8	+ 5/8	+16.6
N	AUTOMATIC DATA PROC	21- 44	37	- 1/2	-1.3
D	CGA COMPUTER ASSOC	5- 16	15 1/2	+1 1/4	+8.7
O	COMPUTER ASSOC INT'L	6- 35	29 7/8	-1 7/8	-5.9
O	COMPUTER HORIZONS	8- 20	11 1/2	- 1/2	-4.1
O	COMPUTER NETWORK	4- 10	7 3/8	- 1/8	-1.6
N	COMPUTER SCIENCES	11- 23	18	+1 1/8	+6.6
O	COMPUTER TASK GROUP	8- 22	16	+ 1/2	+3.2
O	COMPUTER USAGE	2- 22	17	+4 1/2	+36.0
O	COMPUTONE SYSTEMS	7- 38	7 1/4	-1 3/4	-19.4
O	COMSERV CORP	7- 20	9 1/4	+ 1/2	+5.7
D	CDMSHARE	7- 13	10 3/4	- 3/8	-3.3
N	CULLINET SOFTWARE	12- 50	46 3/4	- 5/8	-1.3
O	CYCARE SYSTEMS INC	9- 27	20 1/2	+ 1/2	+2.5
N	ELECTRONIC DATA SYST	10- 42	39 1/8	+2 7/8	+7.9
O	HOGAN SYSTEM INC	27- 53	46 3/4	-3 1/2	-6.9
N	GENERAL ELECTRIC CO	45- 58	52 1/4	+2 1/8	+4.2
N	GTE CORP	39- 48	43 3/4	0	0.0
N	INFORMATICS INC	10- 34	27 1/8	+1	+3.8
O	INFOTRON SYSTEMS CDR	25- 43	35	-2	-5.4
O	KEANE ASSOCIATES	4- 15	10 1/4	0	0.0
A	LOGICON	8- 30	27 3/4	- 3/8	-1.3
O	MCI COMMUNICATIONS	15- 34	18 1/8	+ 7/8	+5.0
D	MNGT SCI AMER INC	8- 33	32 1/4	+2 1/2	+8.4
D	MATHEMATICAL APP GRP	12- 22	15	+ 1/2	+3.4
D	MICDM SYSTEMS INC	25- 50	46 3/4	+ 1/4	+0.5
O	MONCHIK-WEBER CP	10- 22	14 3/4	+2 1/4	+18.0
O	NATIONAL DATA CORP	5- 26	17 1/4	- 7/8	-4.8
D	ON-LINE SOFTWARE INT	19- 27	23 1/2	0	0.0
D	PANSOPHIC SYSTEMS	8- 30	25 3/8	- 1/2	-1.9
N	PLANNING RESEARCH	6- 21	15 5/8	+ 1/8	+0.8
O	POLICY MGMT SYSTS CP	36- 68	59 3/4	-2	-3.2
D	PRDGRAMMING & SYS	1- 8	7 3/8	+ 1/4	+3.5
O	REYNOLDS & REYNDLO	17- 53	45	-2 3/4	-5.7
O	SEI CDRP	11- 34	32 1/4	- 1/2	-1.5
D	SHAREO MEOICAL SYST	13- 43	43 3/8	+2 1/2	+6.1
O	SCIENTIFIC COMPUTERS	6- 14	11 3/4	- 1/2	-4.0
O	SOFTWARE AG	5- 17	11 5/8	+ 1/2	+4.4
N	TYMSHARE INC	12- 30	21 5/8	- 1/8	-0.5
A	URS CORP	5- 18	14 3/8	+ 3/8	+2.6
N	WYLY CORP	7- 17	11 5/8	- 5/8	-5.1

COMPONENTS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE SEP 28 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	ADVANCEO MICRO OEV	13- 35	31 3/4	+ 1/4	+0.7
O	ADV'O SEMICDNOUCTOR	12- 34	30 1/4	-1	-3.1
N	ANALDG DEVICES INC	18- 42	40 3/8	- 7/8	-2.1
O	ANALDGIC CORP	23- 27	25 1/2	-1 1/4	-4.6
N	APPLIED MAGNETICS CP	19- 37	32 1/4	+ 5/8	+1.9
N	TERADYNE	14- 37	37 1/4	+4 1/4	+12.8

PERIPHERALS & SUBSYSTEMS

EXCH		PRICE 1982-83 RANGE (1)	CLOSE SEP 28 1983	WEEK NET CHNGE	WEEK PCT CHNGE
P	AM INTERNATIDNAL	2- 7	4 7/8	-1 1/8	-18.7
A	ANDERSDN JACOBSON	9- 26	11 3/4	- 3/4	-6.0
O	AUTO-TRDL TECHNDLOGY	8- 29	23 1/4	- 3/8	-1.5
D	BANCTEC INC	7- 33	15 1/4	-1	-6.1
A	BEEHIVE INT'L	4- 15	9 3/4	-1 1/8	-10.3
A	BOLT.BERANEK & NEW	9- 60	54 1/2	-2 3/4	-4.8
D	CAMBEX CORP	2- 4	2 1/4	- 1/8	-5.2
N	CENTRONICS OATA COMP	6- 28	25	-1 5/8	-6.1
A	CETEC CORP	4- 12	10 7/8	+ 7/8	+8.7
D	CDGNITRONICS	2- 20	1D	-1 1/8	-10.1
O	COMPUTER DEVICES INC	3- 21	3 5/8	+ 1/8	+3.5
D	COMPUTER TRANSCEIVER	4- 12	6 3/8	0	0.0
N	COMPUTERVISION CORP	19- 53	51 1/2	- 1/4	-0.4
N	CDNRAC CORP	17- 38	18 1/2	- 7/8	-4.5
A	DATAPRDDUCTS CORP	16- 41	29 1/4	+1 1/4	+4.4
A	OATARAM CORP	5- 12	10 1/2	- 3/4	-6.6
D	OATA SWITCH CORP	13- 41	34 1/2	- 1/2	-1.4
O	DATUM INC	2- 17	11 1/2	-1 1/4	-9.8
O	DECISION DATA CDMPUT	3- 16	11 7/8	- 1/2	-4.0
O	DOCUTEL-OLIVETTI	18- 39	19	-3 7/8	-16.9
N	ELECTRONIC M & M	5- 11	8 1/2	- 1/8	-1.4
D	EVANS & SUTHERLAND	18- 50	42 1/4	-3 1/4	-7.1
D	GANDALF TECHNDLDGIES	9- 22	9 1/4	- 5/8	-6.3
N	GEN'L OATA CDMM IND	6- 29	27 7/8	- 1/4	-0.8
O	GREAT SOUTHWEST IND	2- 6	1 3/4	0	0.0
N	HAZELTINE CORP	7- 31	25	-1	-3.8
D	ICOT CORP	3- 10	4 1/2	- 7/8	-16.2
D	INFORMATION INTL INC	10- 22	16 1/2	- 1/2	-2.9
O	INTEL CORP	11- 45	43 1/2	- 1/4	-0.5
O	IPL SYSTEMS INC	5- 14	8 1/2	- 1/4	-2.8
A	LUNDY ELECTRDNICS	7- 19	14 7/8	+2	+15.5
O	MEGADATA CORP	9- 15	13 1/2	+ 3/4	+5.8
A	MSI OATA CORP	16- 37	17	+ 1/2	+3.D
N	NASHUA CORP	9- 29	25 5/8	- 3/8	-1.4
O	NETWORK SYSTEMS CORP	8- 34	21 5/8	-4 1/8	-16.0
N	NO AMERICAN PHILIPS	47- 73	69 5/8	-2 5/8	-3.6
N	NORTHERN TELECOM LTO	22- 49	47 5/8	+1 1/8	+2.4
D	OMEX	3- 6	6	0	0.0
N	PARAOYNE CDRP	14- 30	18 3/8	-2	-9.8
A	PENRIL CDRP	7- 14	10 7/8	- 1/8	-1.1
D	PHOENIX AMERICAN INC	7- 17	14 1/4	0	0.0
N	PLESSEY CO (ADR)	26- 41	32 1/4	+ 1/2	+1.5
O	PRINTRONIX INC	23- 34	22 3/4	-2 1/4	-9.0
D	RAMTEK CORP	12- 26	15 1/8	- 1/8	-0.8
N	RAYTHEON CO	42- 58	47 3/8	- 1/2	-1.0
N	RECOGNITION EOUIP	4- 17	16 5/8	+1 5/8	+10.8
N	ROLM CORP	40- 80	66	+1 3/8	+2.1
N	SANDERS ASSOCIATES	60-120	118 1/2	0	0.0
O	SCAN DATA	1- 3	1 1/2	0	0.0
O	SCAN-TRON CORP	12- 16	13	- 1/4	-1.8
N	SCIENTIFIC ATLANTA	15- 23	17 1/8	- 3/8	-2.1
N	STORAGE TECHNDLDGY	16- 33	19 7/9	- 3/4	-3.6
D	SYKES OATATRDNICS	6- 27	6 1/2	D	D.D
D	SYSTEMS & CDMP TECH	27- 39	35	+1	+2.9
A	T BAR INC	7- 17	10 1/8	- 1/8	-1.2
A	TAB PROOUCTS CO	8- 30	24 5/8	+ 1/4	+1.0
O	TANOON CORP	19- 35	27 1/2	-2 3/4	-9.0
A	TEC INC	6- 12	7 7/8	+1 1/4	+18.8
N	TEKTRDNIX INC	34- 87	79 1/2	-2 5/8	-3.1
N	TELEX	5- 32	27 3/8	D	0.D
D	TESDATA SYSTEMS CP	3- 17	11	-1 3/8	-11.1
N	TIMEPLEX INC	7- 29	24 1/8	+ 1/8	+0.5
D	VISUAL. TECHNOLOGY	9- 26	19 1/4	- 1/2	-2.5

SUPPLIES & ACCESSORIES

EXCH		PRICE 1982-83 RANGE (1)	CLOSE SEP 28 1983	WEEK NET CHNGE	WEEK PCT CHNGE
N	AMERICAN BUS PRODS	11- 33	32 3/4	+ 1/2	+1.5
N	BARRY WRIGHT	13- 31	30 1/4	- 1/4	-0.8
A	OUPLEX PRDDUCTS INC	12- 26	24 3/4	+1 1/8	+4.7
N	ENNIS BUS. FDRMS	6- 25	23 1/8	+ 5/8	+2.7
N	3M COMPANY	49- 90	83 1/4	+2 5/8	+3.2
N	MDORE CORP LTD	26- 51	48 1/2	0	0.0
D	STANDARO REGISTER	11- 34	32	+1	+3.2
N	WALLACE BUS FORMS	11- 30	26 6/8	-2 1/8	-7.3

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Save this box. It can help you make an intelligent software decision.

1. Can you offer us a complete range of software systems designed to work together?
Or will we have to piece together a patch-work of systems?

2. Are your systems just record keepers, or can they really help us make decisions?
Can we pull together information from any of our integrated systems? In exactly the form we want it?

3. Can you provide business software for both mainframe and microcomputers?
Do you develop this software yourself or do you simply market it for another company?

4. Are your systems truly online so all of our information is current?
How many of your systems are online? How secure are they?

5. Will my company have to be the one that discovers the bugs in your brand new system?
Just how long have your systems actually been used, and how have they been tested?

6. Will you update your systems as technology advances and regulations change?
What are some of your most recent updates? Will you keep us current on regulatory changes?

7. Do your systems really do everything you say they will?
Or will we have to change them or add to them to get the features we want?

8. How long have you been in business?
What are your revenues? What is your growth record? Where will your company be five years from now?

9. How many systems has your company installed?
How many of these were installed in the past six months? How many of your earlier customers are still using —and liking—your systems?

10. Do your financial systems handle unlimited foreign currencies?
Do your financial systems use a common set of currency exchange rates?

11. Can you link our executives' computers directly to the mainframe—so they can get their own information?
Is that software available right now?

12. How will you make sure our own people thoroughly understand your system?
Do you have educational centers near us, or will we have to travel all the way across the country to find one? Will you be there to help during installation and after?

13. How many of your people specialize in software for my industry?
How many accountants work for you? Human resource specialists? Manufacturing experts?

14. Do your systems have built-in features that make them easier to use?
What happens if someone needs help figuring out a feature? Do you have online documentation that's easy to understand?

15. As my business changes will your system be flexible enough to change with it?
Or will we have to pay a lot to revamp it? Or even regenerate it?

These questions will help you when you sit down with individual software companies.

They're tough questions. Relevant ones. And any supplier who is worth his salt should be able to answer them without backpedaling.

Ask MSA

We'll answer all these questions to your satisfaction—plus any others you may have.

In fact, we're probably the best equipped to answer them. Because MSA is *the* software company. We offer the most complete line of totally integrated systems in the software industry, including financial, human resource and manufacturing.

So you avoid the headache of trying to tie together individual systems. (And the even bigger headache of adding to them.)

With MSA's integrated systems, there's no unnecessary duplication of data or effort. Reporting is faster. All your company's information is more timely and accurate—and in the right form.

Our technical edge comes from experience

Staying ahead is easier for a company that's steeped in software technology. MSA has spent years developing, refining, testing and enhancing our systems.

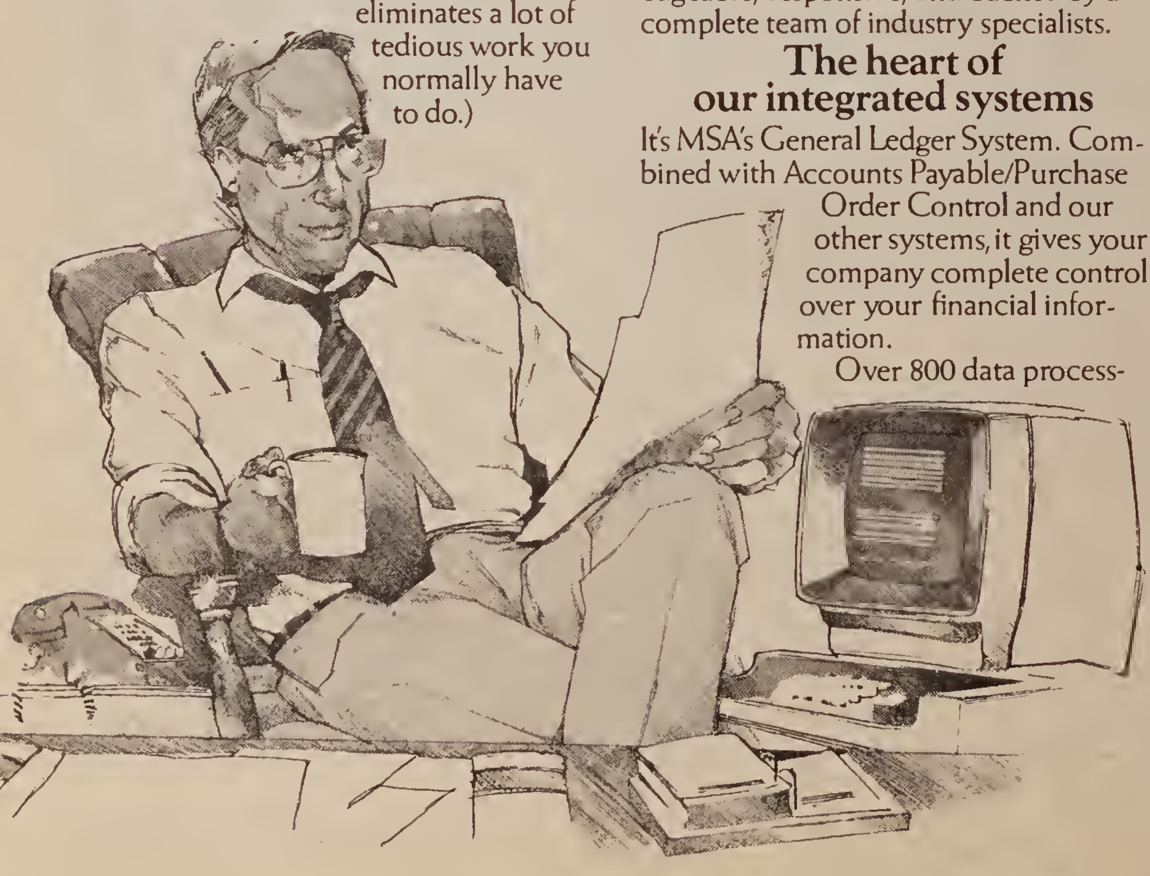
This year alone, we'll invest $25 million to make sure all our systems are technologically razor sharp. That gives us a decided advantage over flash-in-the-pan technology that may not have the bug-free logic of a more experienced system.

It also gives you a decided advantage over "custom" systems you have to update yourself.

MSA relieves you of that time-consuming burden. We update and enhance your software for a full year. Then we continue this service for a surprisingly low annual fee.

Maintenance includes keeping your system up-to-date technologically. Enhancing it with new features that make it work even harder for you.

And making sure it reflects changes in accounting procedures and government regulations, including 401(k), TEFRA, and FAS52. (That eliminates a lot of tedious work you normally have to do.)



35,000 days of training

At MSA, we make sure your people have a firm grasp of our systems. Last year alone, we conducted more than 35,000 student days of customer training for over 1,800 companies. At education centers all over the world, as well as at our headquarters.

From training sessions to cassettes to complete, easy-to-understand documentation, MSA provides the most extensive Customer Education Programs in the industry.

And MSA systems are just as friendly as our people. Our online HELP feature actually guides users through our systems, and EASY-SCREEN™ lets them design their own screens without creating data processing nightmares.

If there's ever a question or problem with our systems, MSA customers are always close to service.

Our Account Managers are knowledgeable, responsive, and backed by a complete team of industry specialists.

The heart of our integrated systems

It's MSA's General Ledger System. Combined with Accounts Payable/Purchase Order Control and our other systems, it gives your company complete control over your financial information.

Over 800 data processing specialists, accountants, and financial experts work together to make MSA's financial systems the most advanced and most highly integrated in the industry.

MSA has the answers

Whatever your size—whatever your business—MSA has a total software solution.

We'll provide the highest quality integrated online software.

We'll tie your business and manufacturing software systems together, using our exclusive Extended Closed Loop™ manufacturing system.

We'll provide business software for your microcomputers, through our Peachtree Software Company.

We'll even link your microcomputers to your company's mainframe—with MSA's Executive Peachpak™ application software. A revolutionary concept that lets executives get the mainframe information they need through their personal computers.

MSA ready-to-install application software
1. General Ledger
2. Accounts Payable/Purchase Order Control
3. Budgetary Control/Encumbrance
4. Fixed Assets Accounting
5. Capital Expenditure Tracking
6. Forecasting & Modeling
7. Accounts Receivable
8. Order Processing
9. Foreign Exchange
10. Inventory & Purchasing
11. Payroll
12. Personnel Management & Reporting
13. ALLTAX™ Taxing System
14. ALLTAX Reporter™
15. Manufacturing Control System (MRP II)
16. Executive Peachpak™
17. Peachtree Software™ business systems for microcomputers
18. Peachtree Software™ office productivity systems for microcomputers

ALLTAX, ALLTAX Reporter, EASY-SCREEN, Executive Peachpak, Peachtree Software, and Extended Closed Loop are trademarks of Management Science America, Inc.

Talk to us

If we've whetted your appetite with our 15 questions, clip the coupon below.

We'll send you a concise booklet that will help you even more in your deliberations. We'd also like to send you more information on how MSA can help you plan for software. And on individual systems.

Just fill in the information below, or contact Robert Carpenter at (404) 239-2000.

Management Science America, Inc.
3445 Peachtree Road, N.E.
Atlanta, Georgia 30326.

☐ Please send me a free detailed brochure.
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